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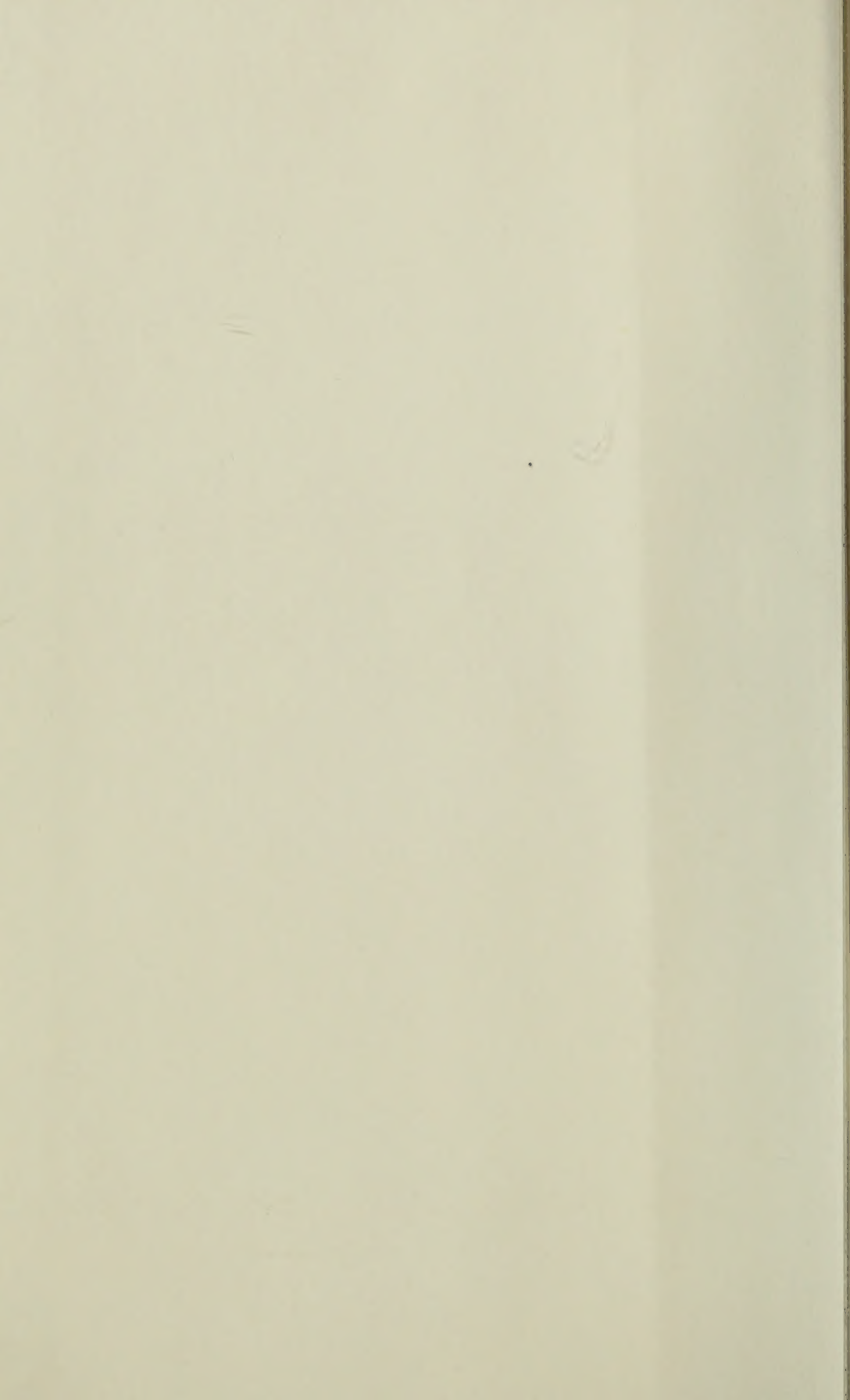
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Light and Color

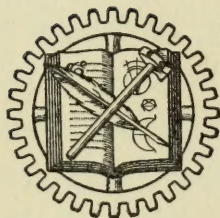
IN

Advertising and Merchandising

By
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COLOR," "VISUAL ILLUSIONS AND THEIR APPLICA-
TIONS," ETC.

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PREFACE

LIGHT and color are powerful advertising and sales media and their potentiality has been greatly extended in recent years by developments in printing and in lighting. They have much in common and, in fact, are inseparable; therefore a treatment of both together is quite a natural course. The author has attempted to analyze light and color as potentialities in advertising and in merchandising, basing his discussions on years of observation and research. The final word has not been written in these chapters; indeed, this volume is but a systematic beginning. However, it is the hope that a study of the material presented will be of value in helping to guide the expenditure of the billions of dollars devoted to advertising and merchandising. It has been the aim to include only established facts and results of explorations into the many byways from which light and color have acquired their effectiveness. Tedious technical details have been subordinated in favor of popular treatment so that this volume would be practicable, helpful and interesting to the general reader, the advertising specialist, the

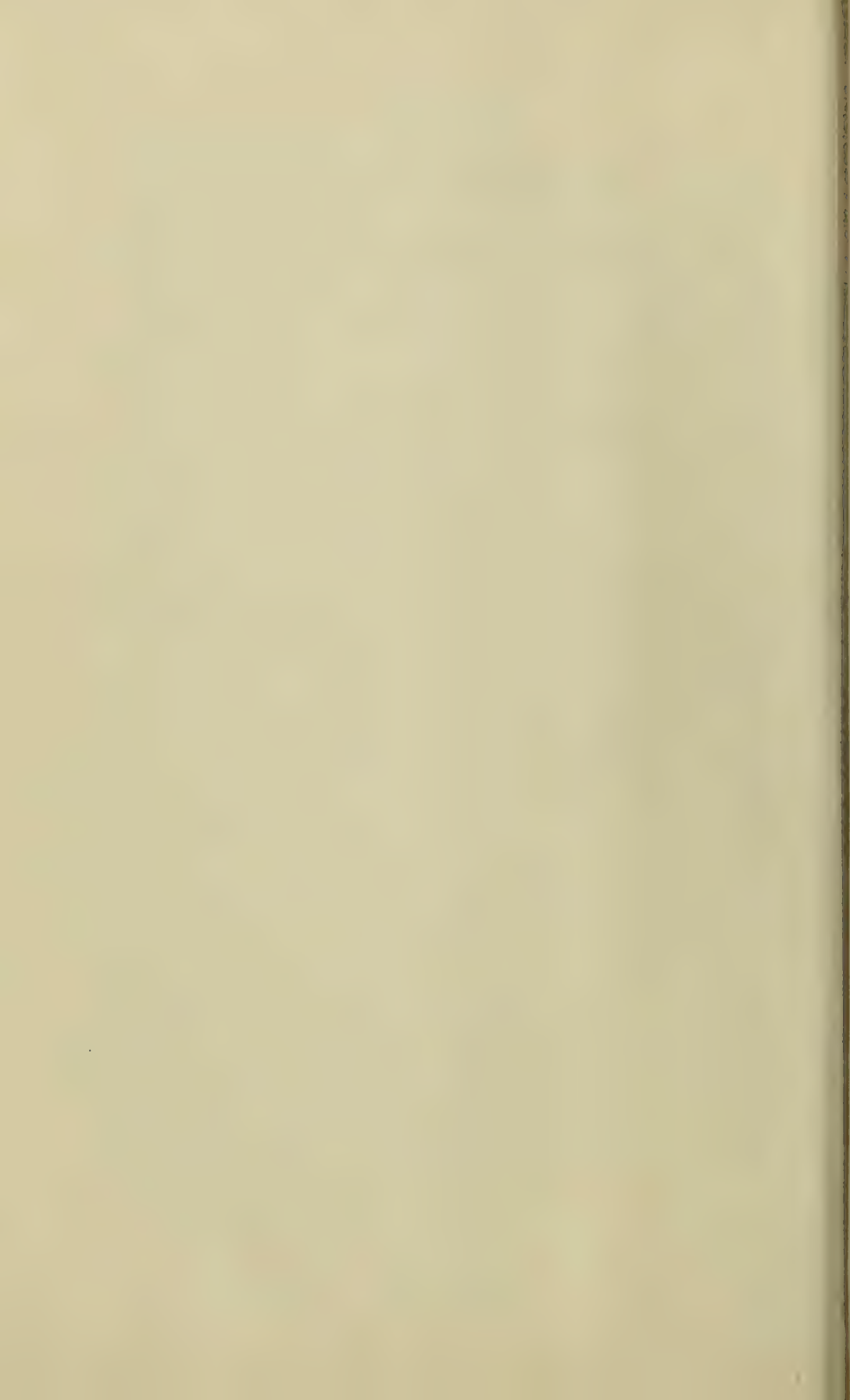
commercial artist, the color printer, the merchandiser, the interior decorator, the lighting specialist, the architect, the manufacturer, and to others who deal with light and color as expressive media.

M. LUCKIESH.

NOVEMBER, 1922

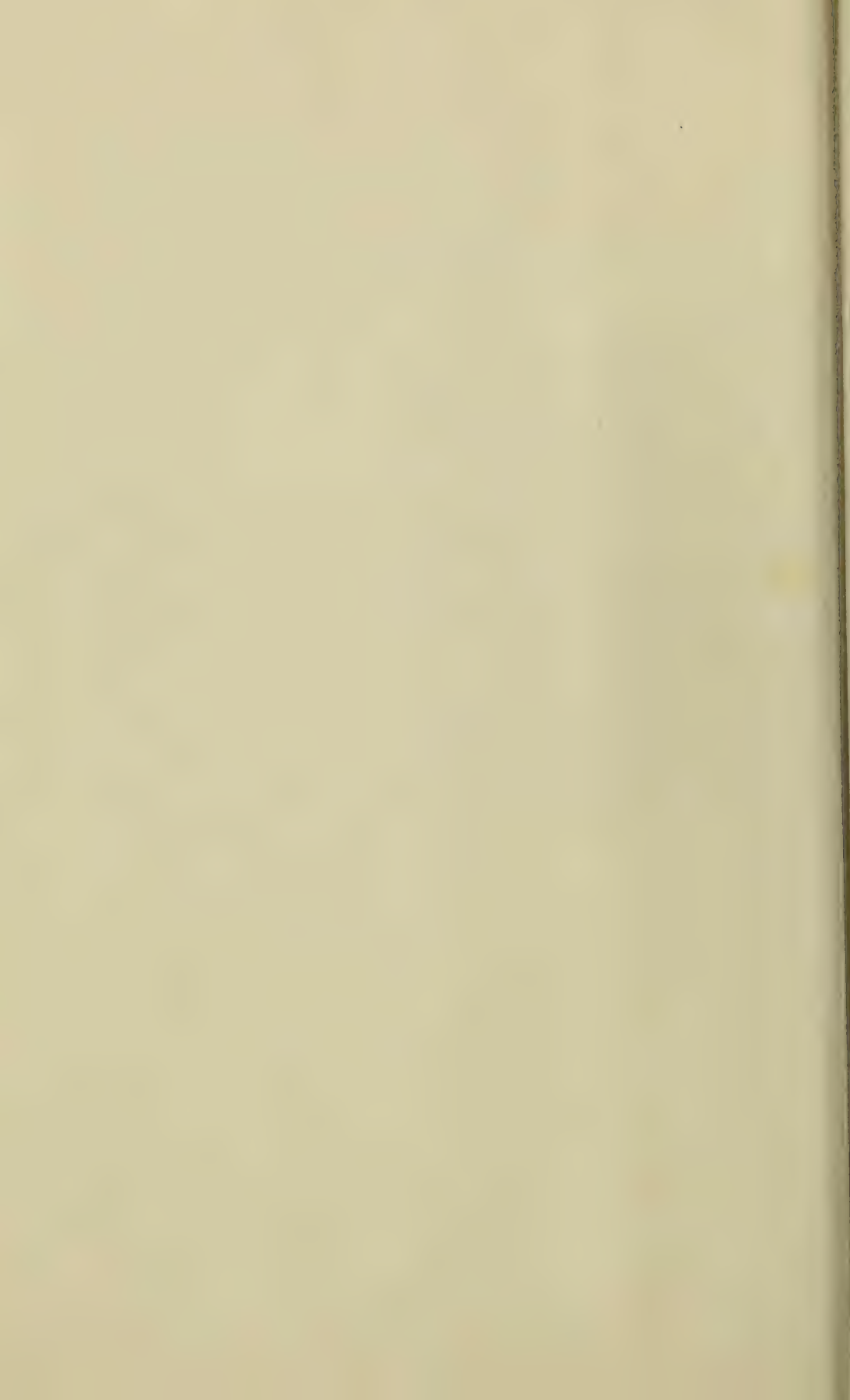
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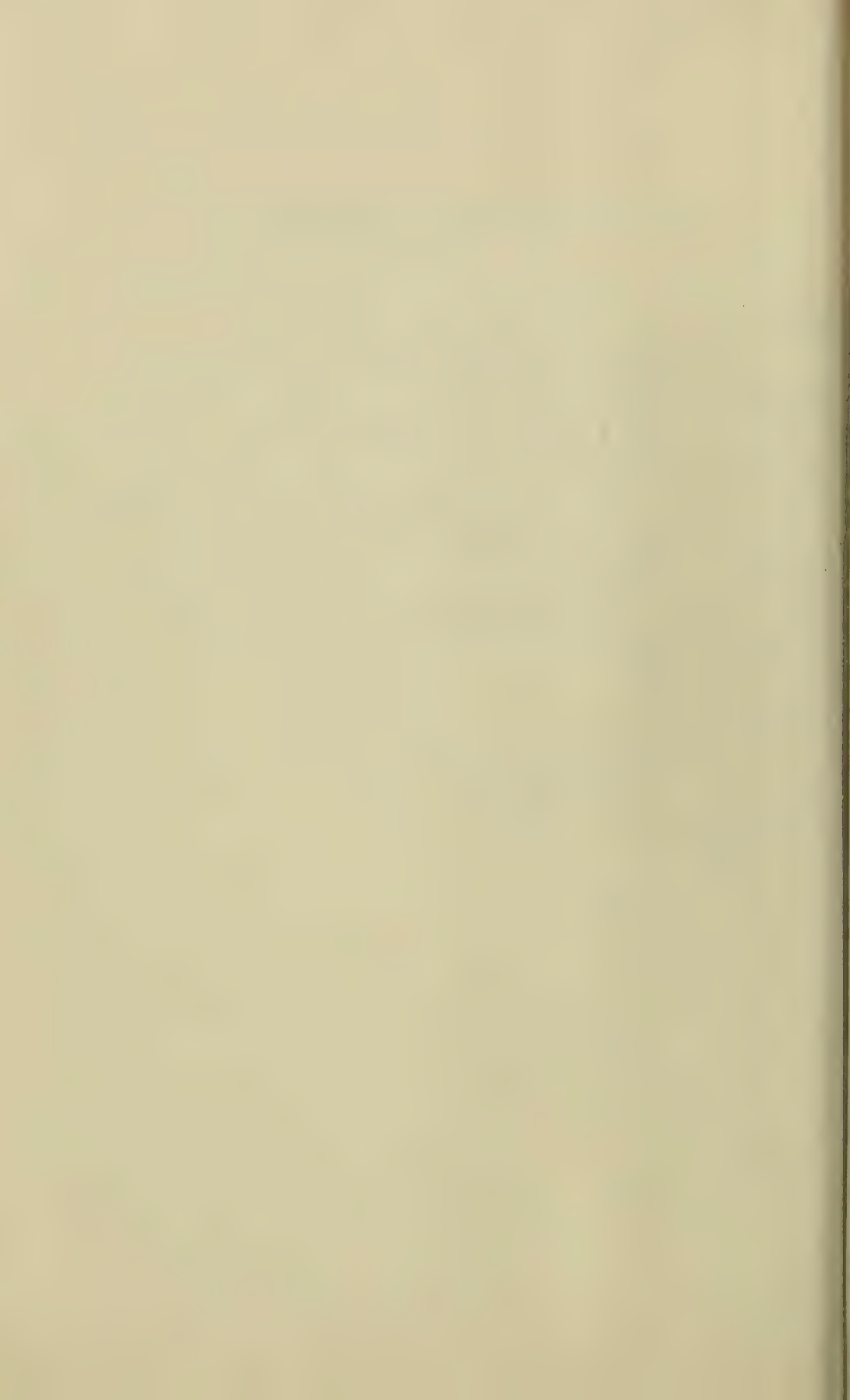
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PLATE

Maxfield Parrish has so successfully employed the powers of color that, in our minds, colorfulness is generally associated with his works. *Frontispiece.*

- I. It is impossible to do justice to a lighting effect by pictorial means; but by using color in the illustration, much of the charm of lighting may be suggested.
- II. Illustrating the principles of the mixture of paints, dyes, inks, etc., and also some color-harmonies.
- III. Illuminating glassware of highly decorative quality is now available in many designs for distinctive interiors.
- IV. Just as a fine instrument at the hands of Paderewski yields the charming Minuet, colors guided by an artist yield the music of light.
- V. Paint is a wonderful medium from the viewpoint of variety of effects obtainable. Decorative schemes can play important rôles in modern merchandising as well as in office, home and factory. In advertising the possibilities of paint, color is very essential.
- VI. Here, color is not only decorative, but adds realism to the product and emphasizes waning natural light.
- VII. Illustrating the effects of colored lights on the appearance of colors.
- VIII. Color not only lends realism to the materials and decorations of a portable lamp but also aids in depicting the environment. Color-printing can also alter the white page of the insert to a more harmonious tint.

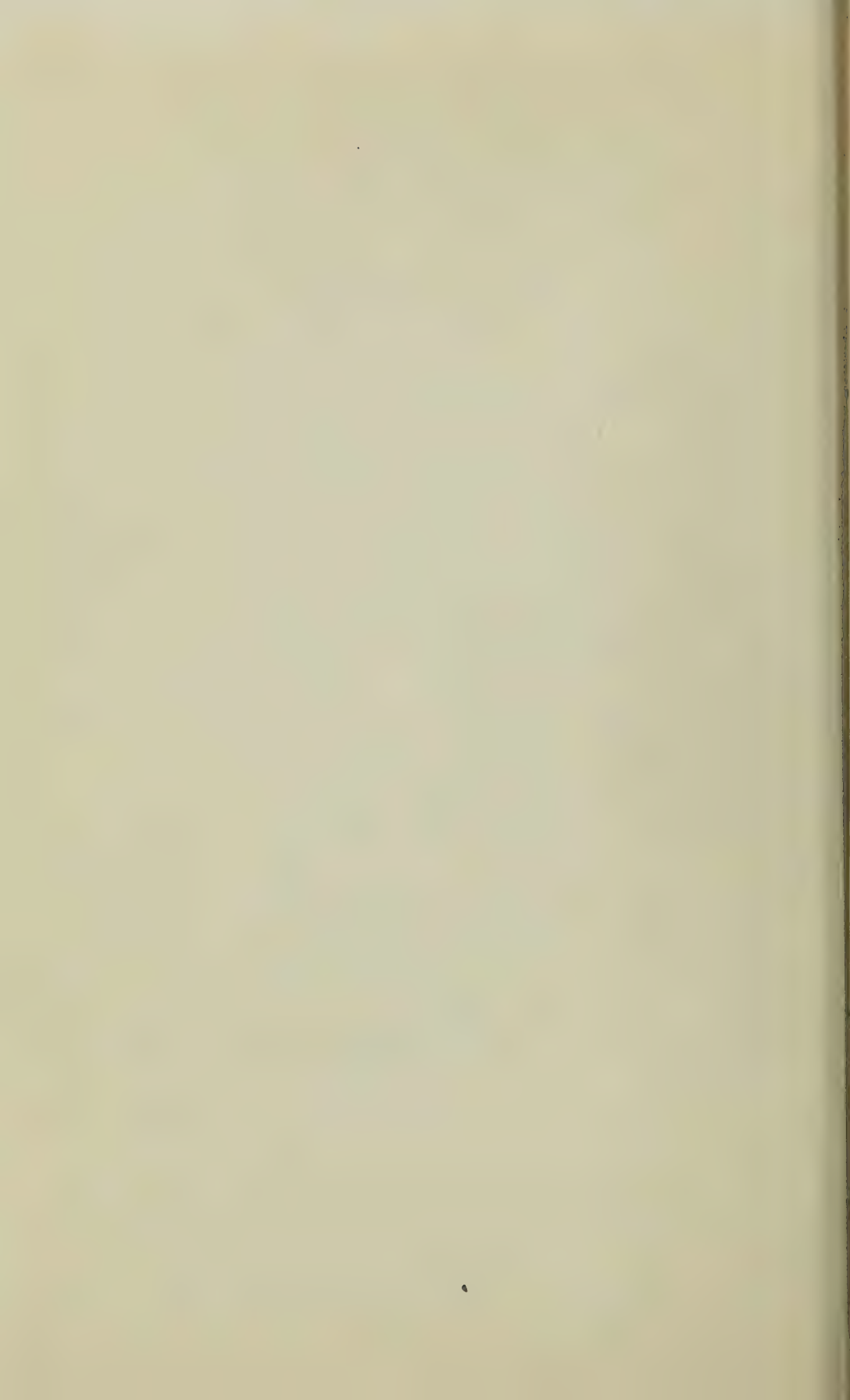
- IX. Color not only attracts attention but emphasizes certain parts of the motor. The subdued color in the background reduces the contrast and produces a more artistic result.
- X. Modern reflectors, colored accessories, and spotlights have placed the wonderful powers of light in the hands of the display-artist.
- XI. Delicacy of coloring is an appropriate garment for this delightful fancy.
- XII. In this case red is very appropriate for it vividly suggests and powerfully emphasizes the evil nature of fire. It is so often the best second color that sometimes it is used where another color would serve better.
- XIII. The color of the paper can be effectively used as a part of the design.
- XIV. When the shadows are deep one color can be very effective on a paper of different color.
- XV. Besides depicting things as they are, harmonious colors suggest quality in a distinctive product.
- XVI. In this advertisement the appeal is not only achieved by color in the advertised product (asbestos Colorblende shingles) but largely by color-harmony of the roof and its environment.
- XVII. Color aids materially this pictorial suggestion of an appropriate place for a box of chocolates.
- XVIII. When a product is beautiful it is a good subject for representation in color.
- XIX. This combination of color lithography and embossing by a patented process depicts textiles with remarkable realism.
- XX. Red as a second color is very appropriate in this case for, besides increasing the attractiveness of the advertisement, it provides the flesh tint.



(Courtesy of National Lamp Works of General Electric Co.)

PLATE I.

It is impossible to do justice to a lighting effect by pictorial means; but by using color in the illustration, much of the charm of lighting may be suggested.



- XXX. The "artificial daylight" units on the show case reveal the true daylight color-values of merchandise thereby helping to make the modern store independent of natural light.
- XXXI. The lighting of distinctive shops should not only be useful and decorative but should be designed so that the particular merchandise appears to advantage.
- XXXII. A bit of The Great White Way in New York where light as an advertising medium flashes messages to a million persons daily.
- XXXIII. By means of artificial light exteriors can be rendered very conspicuous at night. The advertising value of flood-lighting and outline-lighting has been firmly established by some of the most prominent merchandisers.
- XXXIV. This plate is reproduced in color in Plate XXXV.
- XXXV. Note the value of color by comparing this with Plate XXXIV.
- XXXVI. Color-printing depicts everything but the fragrance of flowers— and it may even suggest that.
- XXXVII. The solid blue in the background emphasizes the white fixtures; it is a "retiring" color; it is associated with water; it suggests coolness and cleanliness. In fact, it has no rival for the present purpose.

- XXI. Copper roofing described in black and white can not more than feebly suggest the beautiful colorings which the product possesses. Color-printing is a powerful ally in introducing such a product.
- XXII. The expressiveness of light has been utilized on a tremendous scale by Mr. W. D'A. Ryan on many occasions. Among his many developments is the scintillator consisting of great jets of illuminated steam. Here is illustrated the Zone "salvo" at the Panama Pacific Exposition in which search-lights aggregating over 2½ billion candle-power were used.
- XXIII. Colored paper simplifies color-printing and is particularly useful for decorative effects.
- XXIV. Color aids greatly in depicting the beauty of design in this silk brocade which is representative of the transition between the art of Louis XIV and Louis XV periods.
- XXV. Black has great potentiality. Here it is novel, dignified and effective as a background for color.
- XXVI. Color in a trademark superposes all of its many powers upon what would otherwise be merely outline form. Certainly the use of color has been amply justified for trademarks, wrappers, packages, etc.
- XXVII. The lighting combined with the "crystals," "snowballs" and other decorative features produced a powerful effect of "coolness" in the Alexandria hotel in Los Angeles.
- XXVIII. Modern Incandescent lamps may be safely concealed in fixtures, behind cornices, and elsewhere so that lighting and architecture can be harmonized. A great variety of lighting effects are obtainable.
- XXIX. The store can have all the advantages of natural daylight by means of modern artificial lighting units without the disadvantages of natural daylight *and at no greater cost.*

Light and Color

CHAPTER I

INTRODUCTION

MAN enjoys a number of senses each of which contributes toward his usefulness, sensitiveness, and happiness. He would relinquish none voluntarily but if compelled to choose he would cling to the last to vision. It is only necessary to imagine the loss of each of the other senses to realize that we could go our usual ways without serious difficulty. But when vision fails us it is calamitous, for the main doorway of impression has been closed. A screen hems us in, impenetrable but for the sounds of the world out of reach and for the touch of things near at hand. For most of us the course of our lives would be abruptly altered. Light and color through which we obtained most of our impressions would no longer be effective. Perhaps only then would we realize their powers of expression and impression.

There is nothing startlingly new in the foregoing paragraph. It is introduced merely to em-

phasize the fact that, in general, the impressions which we gain through the doorway of vision rank first in number, in variety, in appeal, in importance, in vividness, and in permanency. But in dealing with vision we must include light in the same thoughts, for light and vision are dependent upon each other. Besides these there is another element which seems to have been bestowed for good measure. We can exist without the ability to see color but color-vision adds a magical drapery over our surroundings. If we were color-blind we would see an infinite variety of grays. Instead most of us see these grays of many hues varying in intensity of light—a variety of shades; and varying in intensity of color—a variety of tints. Color-vision adds much to most of the impressions which we gain through the eyes.

Therefore light and color are extremely important factors in any appeal through the visual sense. Treatises on advertising generally pass by this phase of color with a superficial chapter. Usually this chapter is an expression of the casual ideas and impressions of a single individual who has not been able to spend much of his time in this complex field. The psycho-physiological realm is one that can be first invaded successfully by the scientist and its secrets can be brought forth only by proper experiments. It would be a

relatively simple matter if we had what might be termed an average individual but we cannot establish an average individual without performing these many and almost endless researches.

Nobody will ever write the last word in such fields and the author does not hope to do more than to present data and analyses which may be helpful to the merchandiser and perhaps interesting to others. Much scientific work has been done pertaining to the expressiveness and impressiveness of light and color but still relatively little is known and much remains unknown. However, many years of attention to various phases of light and color have brought the conviction that a treatment of them from the present viewpoint would be helpful to many involved in various phases of merchandising and interesting even to the general reader.

It is not the hope or the intention to set forth simple rules whereby a mechanic can become a successful merchant by merely beckoning light and color to his aid. The web is too intricate to be completely untangled. It is the primary aim to lead the reader into the many byways so that perhaps through these glimpses of correlated analyses he may use these allies more helpfully or may understand them better. At least he should enjoy a closer acquaintance with their potentialities. Light and color are both treated because

they are so interwoven. Wherever we see color we have light. Color is of importance in advertising and in lighting effects. Light and lighting are of importance quite apart from color. Therefore, color is dealt with first in the abstract and later in its various applications; and while doing this, light, lighting, and vision necessarily intrude so they cannot be passed by unnoticed. In fact, light and lighting are becoming increasingly important and effective in modern merchandising. For this reason their applications are discussed at considerable length in later chapters.

Whether appealing characteristics — both impressive and expressive — of light and color are innate in us or in them, or acquired by us or by them through associations, is a matter that need not concern us here. By ignoring these questions we avoid digressions which cannot be discussed without great speculation and much philosophizing which would lead far afield. However, it is of interest to record our reactions and, in order to lead us to better understanding, to trace the reasons as far as possible by analyses and the results of experiments.

In approaching a subject of this character which involves the psychology of man, race, and state of civilization, it is well to glance back over the course of civilization and view in our mind's eye the conditions which have made mankind

what it is. For countless centuries we were nature's children subject to her whims and unacquainted with the present artificial world which we term civilization. The lights, colors, and lighting of nature strongly influenced mankind during its impressionable infancy. These impressions, gained in the early ages of superstition and comparative ignorance, have endured though modified by usage, knowledge, and other influences of the artificial world which slowly arose. The sun, the stars, and other uncontrollable factors, the colors of great areas of sky, sea, land and vegetation, the colors of details such as fruit and other foods all played their part in moulding and even standardizing the impressions of light and color.

As man progressed he emerged gradually from the purely natural world. He acquired manual skill; he developed intellect; he worked; he thought; he learned nature's secrets; he developed customs. All these were modified by race, climate, and fortune. The web of the artificial world became more and more intricate and in this web, light and color played many parts. The primary effects of nature's lights and colors were modified and multiplied by usage. There was born the present maze of symbolism. The storytellers interwove certain ideas into mythology which further standardized symbolisms and impressions. Primitive languages give us some idea

today of the attitude of our early ancestors. Ecclesiasts dictated the usage of color to the artists and established much of the symbolism of light and color in liturgy. These usages persisted in literature and in painting and were the beginnings of the present language of light and color.¹

As we follow the devious pathways back along the course of civilization we find numberless influences. Many of these appear in later chapters but a few are touched upon here to give the reader a hasty glimpse of the complex course leading to the present psychology of light and color. Among the influences was that of cost, and costly colors became the badge of royalty and of affluence. Man continually extended usage so that certain attributes are now established by common consent. Taste and intellect have left their imprints, and throughout the long and devious pathway to the present time, certain innate or early acquired characteristics have persisted. These are the guide-lines back into the intricate byways of the past for the analyst who would explore. By combining the fruits of these explorations with those of scientific experiments we have much interesting data which it is the aim to correlate.

That light and color are recognized as aids in advertising and selling is evident on every hand. It is also evident that many mistakes in the choice

¹ The Language of Color, M. Luckiesh, 1918.

of colors are made which would have been avoided by a deeper acquaintance with certain fundamentals. Colored advertisements are increasing in number. Those who pay for them believe in their value even though there is little knowledge generally available pertaining to their superiority over black and white. Colors are a prominent part of trademarks, wrappers, cartons and billboards and the signs on the great white ways are blazing forth in increasing brightness and many colors. In all these phases of merchandising many factors influence the degree of effectiveness of the expenditure. Appropriateness, color preference, attention-value, various details of vision, and many other factors play more or less important parts. The combinations of lights and colors and the attendant problems are numberless, therefore this book must confine itself to principles and analyses with perhaps a few representative cases.

Modern artificial light has such potentialities that lighting is beginning to be recognized as a sales aid. A century ago in the age of candles, artificial light was a feeble aid at best. That was the age of *mere* light. It was not until the last century was waning that we entered upon the age of *more* light. The great developments in electric filament lamps during recent years have given birth to the age of *adequate* light. Artificial light costs only one-fiftieth as much as it did a century

ago. This low cost makes artificial light a great aid to the merchandiser. The powerful light-sources enclosed in glass bulbs insure safety and flexibility of lighting which have introduced tremendous possibilities into lighting effects.

The progressive merchant is demanding higher intensities of illumination in store and show-window. Novel and attractive lighting effects are enticing the populace to the store, to the show-window, and to the theatre. The variety of effects due to the mobility of light is becoming recognized. This mobility gives vitality to lighting effects far excelling the fixed expressions of the decorator's media. The wonderful lighting effects in our large theatres, public halls, and other large exteriors as well as those at our outdoor gatherings and expositions cannot be rivalled by the secondary lights reflected from pigments. The work of the sculptor, the architect, the painter, and the decorator is given life and expression by lighting which as a primary medium influences their works and adds much through its mobility.

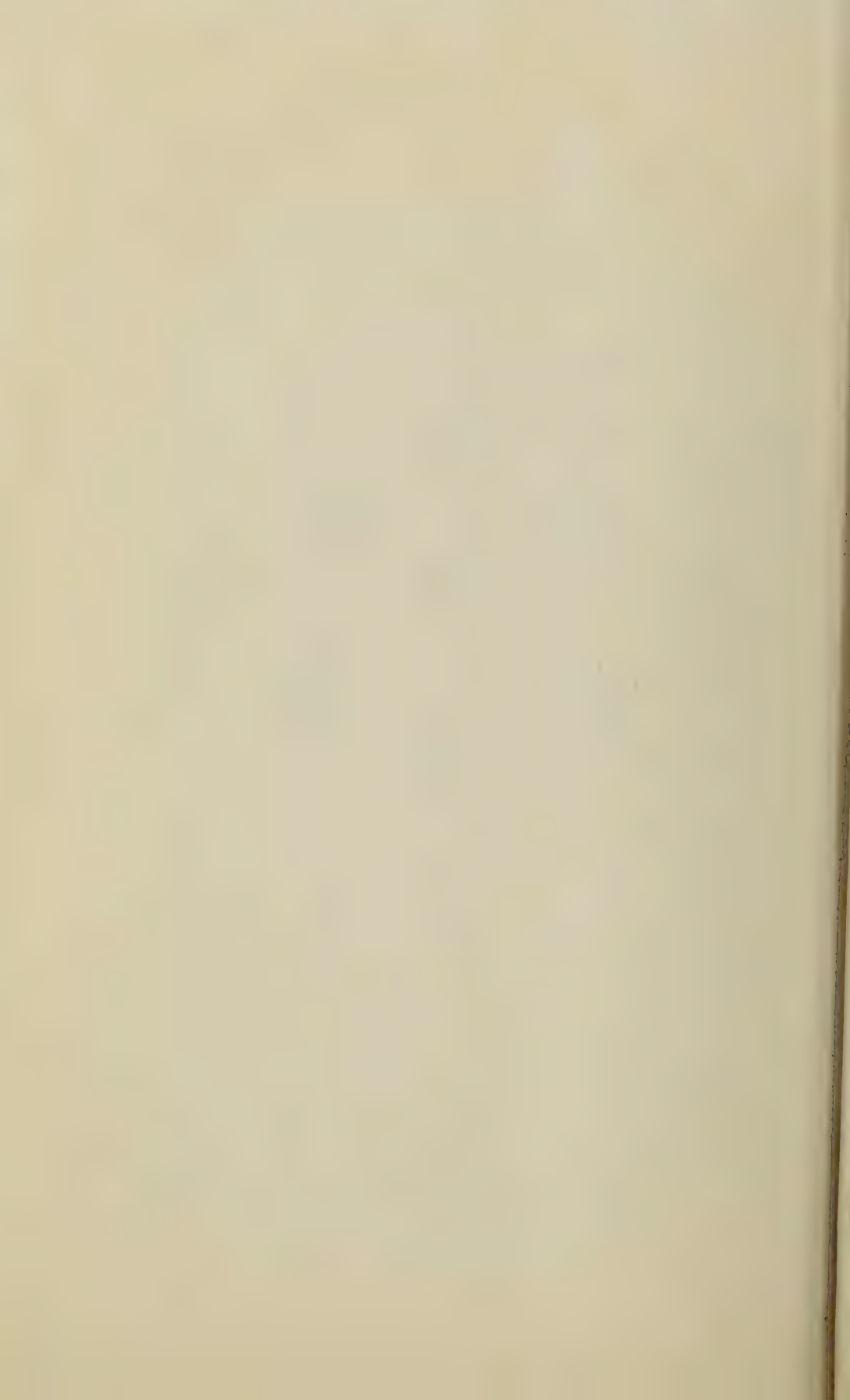
Modern artificial light provides endless possibilities of lighting in the market places and in signs along the highways. Numberless novelties and displays of lighting effects remain still unused but knowledge of fundamentals makes it a simple matter for anyone to adapt light to his needs.



(Courtesy of The Sherwin-Williams Co.)

PLATE II

Illustrating the principles of the mixture of paints, dyes, inks, etc. and also some color-harmonies. Strictly the red should be purplish and the blue should be greenish to satisfy the requirements of subtractive primaries. The additive primaries, which are the basis of mixing lights, are red, green and blue.



There is no better measure of civilized progress than the state of development of artificial light and lighting. We have come a long way in a half century in this respect. If artificial light were denied us how far would mankind progress?

It is the hope that this book will help show the way toward even more effective usage of light and color in merchandising by suggesting possibilities as well as by pointing out misuses. Among the variety of usage of light and color in advertising and in selling there are many instances of thoughtlessness or of lack of acquaintance with the many fundamental principles. As already stated some data have been obtained but much remains to be unearthed. However there is enough available so that these allies can be used wisely instead of unwisely. It is impossible to give many simple rules for meeting the numberless individual cases. The web is too intricate for thorough simplification for all cases collectively but it is possible to provide systematic discussions and revelations of the knowledge available so that any given case may be satisfactorily treated. Furthermore with a knowledge of fundamentals it is often a relatively simple matter to recommend the best color or combination of colors for a certain advertisement or trademark, but to expound the reasons is usually a matter of lengthy exposition. This is also true

of lighting effects, although the lighting possibilities are generally more readily analyzed.

If the chapters which follow provide the advertiser, merchant, and others with suggestions and a clearer view of the possibilities of light and color, and interest the general reader who likes to delve into the byways of knowledge, the author will feel that he has accomplished his purpose.

TERMINOLOGY

Before proceeding to further discussions it is well to define certain terms such as pure color, tint, and shade, regarding which there is much confusion. A pure color will mean here, a color approaching the purity of spectral colors, that is, the colors in the spectrum. For the sake of simplicity pure colors may be termed hues. The nearest approach to pure colors is obtained in practice by some pigments and dyes. In fact many of the concentrated dyes may be considered pure colors for most purposes. Fairly pure colored lights are obtained by using filters of colored glass, of dyed gelatines, etc. Tints are obtained by the admixture of white. A green pigment to which white is added becomes a green tint, the depth of tint depending upon the dilution. A tint of a dye may be obtained by diluting the solution. A tint of a colored light is obtained

by mixing white light with the colored light or by using a tint instead of a pure color for the filter. Shades are merely the reduction of brightness to lower values. Shades of pigments are obtained by the admixture of black. A shade of a colored light merely means a lower intensity or lesser quantity of light. These subjects have been treated in detail elsewhere ¹ and it does not appear necessary to go into detail here. There is no universally standardized nomenclature of color but for our present purpose not a great deal is necessary. In order that the reader may better understand the use of the terms, pure color, tint, and shade as used here the following simple sequences are presented. When white is added to a pure color in increasing quantities we have a series of tints ending in white after an overwhelming amount of white has been added.

Pure color
Deep tint
Medium tint
Light tint
White

When black is added to a pure color or to a tint we have a series of shades ending in black after an overwhelming amount of black has been added.

¹ Color and Its Applications, 1915, 1921, M. Luckiesh. Light and Shade and Their Applications, 1916, M. Luckiesh.

The same is true if we are dealing with a colored light reflected from a white surface, for as the intensity of light is reduced we obtain a series of shades ending in black when there is no light at all. For our present purpose the series can be expressed briefly;

Pure color or tint
Light shade
Medium shade
Deep shade
Black

Sometimes pure colors are termed "saturated" colors and a tint is described as having a certain degree of saturation. A pure color is of 100 per cent saturation. The other extreme of tints, namely white, is of zero saturation. A medium tint may be considered as of 50 per cent saturation. Shades may be described in terms of relative brightness or reflection-factor. This quality can be measured quite apart from any "color" quality. It is what the color-blind person sees whose visual process is otherwise normal. Shades are relative values. A medium shade is one which is only 50 per cent as bright as a perfectly white surface under the same intensity of illumination. It should be obvious that we can have a series of shades of any tint or any pure color.

The absolute brightness of colors is of no in-

terest excepting for very low and very high brightnesses or levels of illumination intensity. It is only at these extremes that visual perceptions become modified to the extent that color relations are altered. This point is of no general importance although it is of some interest. Such details are discussed in a later chapter. It is sufficient here to have a clear understanding of the meaning of tint, shade and pure color in order to proceed to the chapters which follow.

CHAPTER II

CHARACTERISTICS OF COLOR

IT IS apparent on every hand that there is an increasing recognition of the value of color in advertising. It attracts attention; it lends distinction; it vividly depicts the product or package; and it serves in many ways. The merchandise may be depicted by color, by emphasis, by contrast, or by a harmony of colors. Color may attract attention by being applied to the depicted product or package, to the trademark, to the text, to any selling point, or to its use. It may lend realism to the advertisement not only by use on the depicted merchandise but also upon human figures or appropriate surroundings. It may attract attention by use in the border, background, printed matter, illustration or in other ways. It may be used to obtain realism, for decorative quality, to focus attention, or to emphasize certain qualities of the merchandise. Even a single note of concentrated color is emphatic. Doubtless the chief advantage of color is generally the faithful representation of the product or package but even for merchandise which cannot be illustrated in

prominent colors, advertisements in color are effective. Color may be used to suggest or impress various qualities of a product such as attractiveness, refinement, dignity, smartness, delicacy, coldness, warmth, purity, cleanliness, solidity and ruggedness.

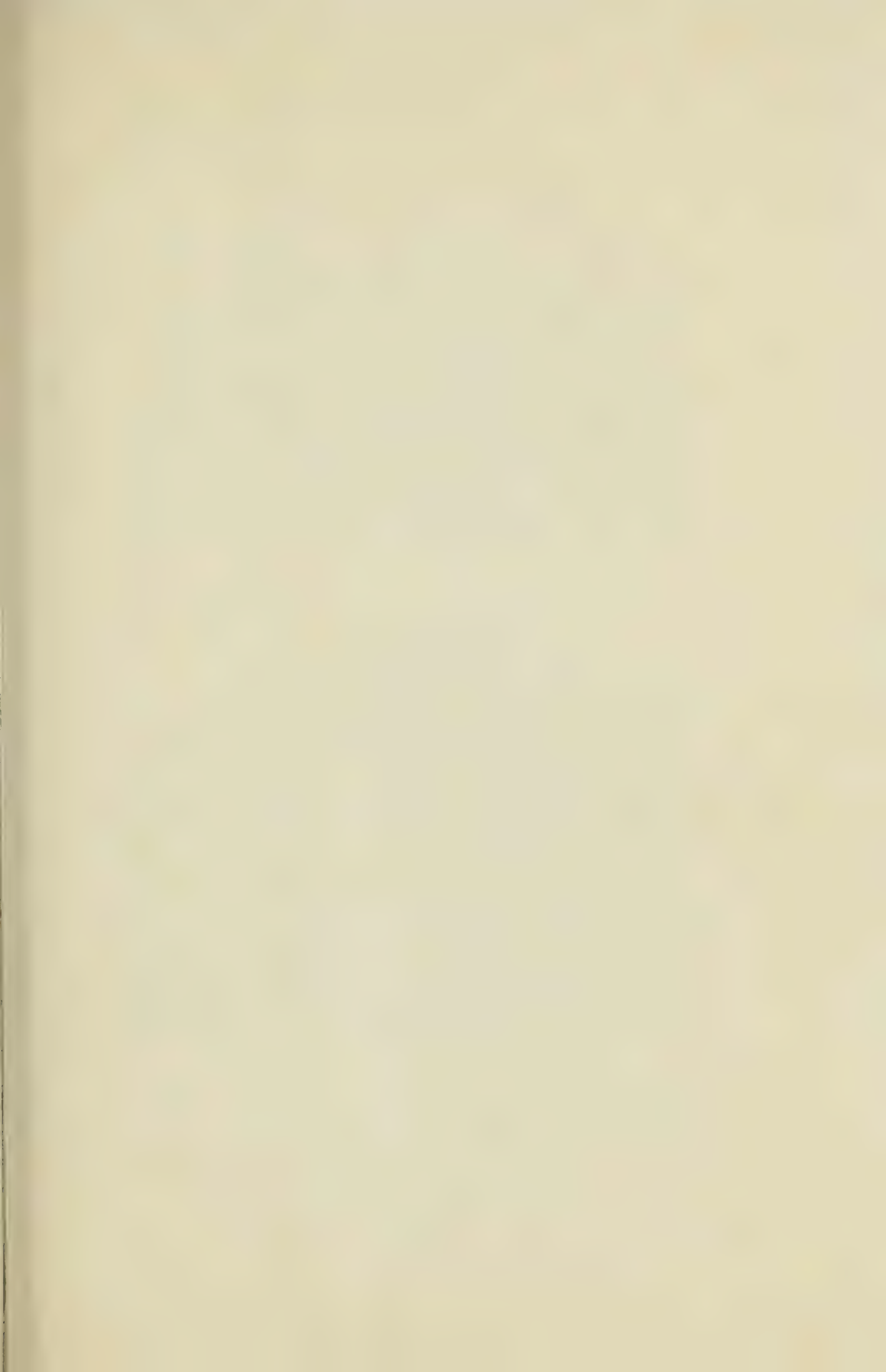
The power of color in advertising and selling cannot be reduced to simplified values at present because the extensive field of psychology has not been sufficiently explored. This is also true of other phases of merchandising and this condition will clarify only as proper experiments are conducted systematically and the results are garnered and coördinated. Advertising is ever concerned with psychology and, therefore, the usefulness of color in advertising will be revealed by studies of the effects of color upon mankind in various stages of civilization and under the complex conditions of modern life. The maze of the science and art of color is intricate and the individual with only a little knowledge in this direction is liable to err often in his analyses. This is evident in certain writings on advertising and in various advertisements.

Before discussing experimental data and various phases of color in detail certain evident characteristics of color from the viewpoint of general appeal will be discussed. Abundant proof now exists which indicates that in certain funda-

mental respects all mankind is affected by colors in the same general manner. In other respects the effects of colors depend upon race, creed, customs, and the level of civilization. When delving still further it is well to remember that we are individuals because each has a different chain of experiences and associations behind him. For this reason a given color may not always possess the same appeal, power, or meaning even though the general characteristics are the same for everyone. The effect of a color also depends upon its location and environment. An opinion regarding the power of use of color based upon its effect upon a single individual may be of little value unless the various influences are recognized. Its impressiveness and expressiveness determined by the average results obtained from representative groups of persons should guide the advertising specialist, the display-man, the designer, and the merchandiser. Furthermore, experiments in this field of psychology must be conducted by those cognizant of the intricacies and far-reaching influences of details which ordinarily will be overlooked by one possessing only a meager and superficial knowledge of the sciences involved.

COLOR APPEAL

Advertising appeals to mankind chiefly through the visual sense and the possession of the color-





(Courtesy of Ivanhoe-Regent Works of General Electric Co.)

PLATE III

Illuminating glassware of highly decorative quality is now available in many designs for distinctive interiors.

sense makes color an important feature in advertising. The value of color is well established for proof exists in its generous use in magazines, catalogues, trademarks, wrappers, packages, signs, and in lighting effects. It is difficult to ascertain the relative pulling power of a colored advertisement compared with one in black and white, but in some cases it pulls many times more strongly than its increased cost necessitates. Many large advertisers have no exact figures on this subject but their continued use of color is proof of their belief in its power. Of course the environment has much to do with the effectiveness of a colored advertisement other things being equal. For example, if the pages in magazines were all done in colors, a black and white page would be conspicuous owing to its novelty and would perhaps be a valuable advertisement. The problem for the specialist in advertising and selling in regard to color is to ascertain its workings and to recognize the many influences.

The sources of information regarding the effectiveness of color are found on every hand. Those interested should observe the use of color and the unconscious reactions of persons toward colors and various colored environments. But conclusions drawn from a few instances without recognizing the subtle and more or less obscure influences are dangerous. Many experiments can

be conducted without the knowledge of those whose reactions are being observed. Such experiments can be devised and carried on in the home, office, store or factory without requiring of the experimenters anything more than alertness and an observing habit. Let these observations accumulate before drawing conclusions, because the web is intricate and the variations among individuals are very great for certain reactions to color. Knowledge pertaining to the powers of colors and to their effects upon mankind may be drawn from many such sources as nature, literature, the theatre, symbolism, the decorative arts, the fine arts, and usage. Mankind is using color everywhere and thus is furnishing numberless examples which combined hold the keys to the solution of the expressiveness and impressiveness of color.

Nations and creeds differ somewhat in their use of color. Yellow may be sacred in China; it may be used to paint the abodes of felons in another country; and it may be the symbol of quarantine for several nations. It may perform all these offices in a single country so that other considerations, perhaps the particular shade or tint or conditions of usage, must distinguish between its various representations. Persistent usage of color in such ways — and there are many such usages — helps to formulate the language of color.

Mankind is oftentimes unobserving of color unless it is novel, emphatic, ludicrous, or out-of-place. For example, many may pass the day oblivious of the magical drapery of color spread over everything. The variety of interesting color in nature may be unheeded except in such striking changes in nature's cloak as the sudden bursting forth of the riot of autumnal colors. Even then many persons do not note the magical change. The marvelous sunsets at the end of each day are consciously seen by relatively few persons, but if one of these gorgeous displays is fixed upon canvas and placed in the comparatively drab environment of an interior it attracts attention. The endless variety of landscapes is unnoticed but it would be missed if the magical drapery disappeared. Such considerations provide clues pertaining to the methods which will awaken the attention of mankind by the use of color. Where color has always existed man is indifferent to it. The greatest value of color lies in awakening man from his perpetual indifference or in bringing him back to consciousness. The remaining attributes of color then come into play and these should be utilized in an appealing and forceful manner to reinforce the selling power of an advertisement.

SOME CHARACTERISTICS OF COLOR

The appeal of color can be analyzed into quite a number of characteristics which are more or less interwoven. Doubtless there would be much difference of opinion as to the relative independency and importance of the various characteristics but that need not concern us here. In order to obtain a glimpse of the properties of color a few characteristics are briefly discussed in the paragraphs which follow. These overlap more or less, but dissection of this kind is necessary if the powers of colors are to be revealed.

Vividness may arrest the attention of an individual but it should be recognized that his awakened interest adds responsibility to that which has accomplished the awakening. Care should be exercised in the combination of characteristics and use of colors so that the reaction which follows is not one of disappointment or even of disgust. Aroused interest is the more susceptible to disappointment. In a charming neighborhood of well-kept homes, a brilliant red house will attract attention and then disgust the person of refined taste. A spotless white house freshly painted will attract attention amid its shrubbery and then leave a pleasing impression. Advertisements of certain automobiles would attract the attention if the car were in scarlet red. The

color would not be inappropriate if it were applied to a car of the so-called racy sporting type which is built for speed and noise or speedy and noisy people. Such an advertisement for a car which was meant for the more conservative element would attract attention but certainly would not pull.

Novelty in the use of color may awaken interest but the observer may then be disgusted with its incongruity or ludicrousness. Vividness, novelty, and pulling power should not sacrifice appropriateness; they should be allied to it. If a magazine is printed wholly in color an advertisement in black and white would be novel and in a sense vivid. When all advertising is done in color there would be novelty and vividness in black and white. Color may be used to vividly depict various qualities of advertised products.

Appropriateness in the use of color involves the advertised product and the class to whom the appeal is made. It also involves the advertising medium such as the show-window, newspaper, magazine, or billboard. Vivid contrasty colors may be used on a billboard amid a green landscape in the country that would be garish in a booklet, in a first-class magazine, or on an artistic calendar even though the same product were advertised in the various cases. In fact, the billboard amid the variegated landscape of the

country-side must have striking colors to be noticed and read by those speeding by in automobile or train. This is also true of many signs on the white ways. Artistic taste as well as all the knowledge of esthetics and color-harmony is available to insure appropriateness.

Attractiveness of color may be due to exquisite harmonies, striking contrasts, excellence of technique, vividness, novelty, overwhelming areas, and other factors. Many of the colored advertisements in the better magazines are works of art, or at least masterpieces of decorative treatment. The subject may not be wholly the product advertised and still not detract from the effectiveness of the advertisement. Some of the wonderful paintings of the fairer sex advertise hosiery, cosmetics and dress goods very well, but occasionally the product is robbed of attention by the extreme attractiveness of the human figure, border or scenic background. This error is not common but it occurs occasionally. However attractiveness is largely a matter of art work and it can be realized without reducing the effectiveness even when the product is a minor part of the composition. Color in advertising can only be justified when it makes the advertising more effective. If it merely beautifies or makes the advertisement more attractive perhaps it is worth while. However, other characteristics should

combine to make the additional investment pay real dividends in adequate sales. The attractiveness due to color may arise from its use in the border, in the type, in the background, in the illustration, or in the meaningless spots. Of course all such factors as novelty and vividness attract attention but attractiveness in the sense used here implies artistic value to which such factors as harmony, beauty, design and technique are the more important.

Realism as obtained by color is one of the simplest and perhaps the most generally useful characteristics of color. The faithful representation of the product or package provides the observer with an impression which is likely to last longer than one which is less faithful due to the absence of color. Realistic color makes food products "good to eat." It depicts innumerable other products in a vivid manner. It pictures products as they are and makes them attractive. This most valuable characteristic of color may be utilized not only by using color to depict the product or package but also by employing color on human figures and backgrounds, and by emphasizing certain qualities of the product.

Usefulness of color in relation to an advertised product is closely allied to realism. Color may largely represent the value of products such as paints, dyes, and lacquers. From a decorative

viewpoint the colors of many materials such as wall-coverings and textiles are of supreme importance. In such cases advertisements which attempt to suggest the products in black and white are certainly weak in pulling power compared with those which depict the actual colors of the products. When color is a part of the usefulness of the product, the use of colored advertising attains supreme realism.

Novelty of color may arise from incongruity, ludicrousness, daring, and combinations of these. If a man dares to wear his wife's red hat on a public street the incongruity is ludicrous. Novel uses of color in advertising are justifiable, necessary, and often valuable, but the advertising specialist should be certain of his ability to sense the result upon the observer's mind. Color affords one of the best means of attracting attention through novelty which is so universally sought in advertising and selling.

Distinctiveness of color may be used in advertising to associate a certain color persistently with a certain product. It may be the ever-present "finger-print." Nothing can generally compete with color in this respect. A certain soap may always have a green wrapper with a black band. A distinctiveness may be given to the advertisements of a company by the character or quality of the advertisements and in this respect



(Courtesy of Steinway and Sons)

PLATE IV

Just as a fine instrument at the hands of Paderewski yields the charming Minuet, colors guided by an artist yield the music of light.



color serves very effectively. The atmosphere and style may remain the same but the colors may vary; however, color even in such a case makes the distinctiveness of technique possible. This quality may be introduced by using color in a great many ways such as on the product, package, trademark, text, background, isolated spots, arrows, and borders. To invoke the aid of color to lend distinctiveness in the best manner, requires imagination and creative ability. If the chosen usage is to be perpetuated very serious thought should be given to the subject.

Innate appeal of color is a more or less indefinite characteristic. Probably colors possess an innate appeal entirely independent of other factors. However, in actual practice it is complicated by such psychological factors as association, culture, appropriateness, esthetics, affective value, preference, and usage.

Symbolisms of light and color are very well established. They have arisen from usage or have been adapted from nature. Therefore they vary somewhat with race and its peculiarities. To use established symbolisms wisely requires more than a superficial knowledge of them and, inasmuch as many have been established by usage, glimpses into the depths of these byways are desirable. Particularly when advertising is done in foreign countries and products are shipped there it is im-

portant to study color deeply. For example, where yellow is a sacred or royal color it would have a different value than where it is in disrepute. None of our worst newspapers uses yellow ink. One of our largest merchandisers uses a red monkey on the packages which are shipped to a certain primitive people to whom this symbol is sacred. Among its various meanings red indicates fire and danger in certain civilized countries and it has been used widely in advertisements to suggest these hazards; however, in general the symbolisms of light and color have not been employed to their fullest extent. This subject has been treated elsewhere¹ in detail and briefly in a later chapter.

¹ The language of Color, by M. Luckiesh, 1918.

CHAPTER III

COLOR PREFERENCE

THERE are so many phases of light and color which must be studied in order to be able to approach any specific application of light and color in merchandising that it is difficult to determine upon the best order of presentation of the discussions. Furthermore there are various strategic points from which to invade the vast unexplored wilderness of the psychology of color by means of experimental research. Certainly one of the most important phases of color is the preference indicated by a large group of representative persons. By conducting experiments in an approved manner very definite data can be obtained pertaining to the ranks of colors in their order of preference.

Such studies should be conducted so as to reveal the difference, if any, exhibited by the two sexes in color preference. Furthermore, not only pure colors but also tints and shades should be studied. This can be done with light reflected from colored media, with colored transparencies viewed against a bright background, or with

colored lights reflected from white or gray papers. Brightness and purity of color being equal, the results are bound to be the same by the various methods. In fact the observers would not know the difference in the three methods of presentation of color if care is exercised in devising the experiment.

It appears best to present the results of one extensive investigation more or less in detail and to supplement this with the results of other experiments. Six pure colors, namely, red, orange, yellow, green, blue, and violet were first chosen for the work. The violet was in reality a bluish purple as most so-called violet colors are in actual practice. Then six medium shades and six medium tints of these respective colors were chosen. This series of eighteen colors was then presented to the subjects by the approved method of "paired comparisons;" that is, each color was compared with each of the remaining seventeen colors. There are 153 combinations of eighteen colors taken two at a time. The order of presentation of the 153 pairs was determined by chance beforehand and was very haphazard, thus eliminating memory factors. Furthermore, the greatest precautions were made to prevent the slightest suggestion. The subjects were instructed to forget everything else and live in a world of the color they were viewing. The aim

was to eliminate association as much as possible and to obtain a measure by means of the preferential method of the innate appeal of the various colors. The results are those of "absolute" preference of colors in so far as possible.

The subjects were first- and second-year college students; 115 males and 121 females. The level of intelligence of the subjects in this investigation is of less importance because the fundamental preference is to be obtained as free as possible from the influences of association, and therefore of intelligence and culture.

The investigation involved more than 35,000 individual records of the preferred color of each pair of colors. Some of the readings were thrown out owing to illegibility or very obvious errors. The colors were numbered and were referred to entirely by number.

In order to give an idea of the magnitude of the investigation and to show the relative preference of the subjects for tints, shades, and pure colors the following table is presented.

TABLE I.—TOTAL FAVORABLE CHOICES.

	115 Males	121 Females	Both
Pure colors.....	7399	6836	14235
Tints.....	4906	5977	10883
Shades.....	5064	5378	10442
AVERAGE FAVORABLE CHOICES			
Pure colors.....	64.2	56.5	60.4
Tints.....	42.7	49.3	46.0
Shades.....	44.0	44.5	44.3

This indicates conclusively that for this group of subjects pure colors are much preferred; that is, when considering colors for color's sake, the pure colors are more preferred than tints and shades. The same results have been obtained for infants and savages, and evidences of this preference for the purer colors are available on every hand among primitive beings. From the viewpoint of absolute color preference, it appears that we are all savages, regardless of age, nationality, creed, intelligence, or culture.

The interpretation of these results for use in advertising indicates that at least wherever color is used purely for color's sake, pure colors should be chosen. That is, where the color has no bearing upon the advertised product or its use, it should be pure or saturated. This is an important point in choosing a color for a trade-mark, for a package, or for any purpose where the color does not involve esthetics, harmony, or anything measured by intelligence or culture. This does not mean that pure colors should not be used in other cases. Of course, pure colors are darker than tints, so that they do not always carry as far as deep tint. This sometimes requires a slight compromise when it is important that the color be seen at considerable distances. This general preference for pure colors indicates that attention and interest will be gained by their use and

therefore they should be used in every case where other considerations do not rule against them. Furthermore, it is well to choose colors which possess the most powerful innate appeal; that is, colors ranking high in the preference order of pure colors. This further step is discussed later.

At this point it is well to dwell upon the difference between absolute and relative color preference. There are sufficient data to prove that savage, infant, and civilized man are similar in their absolute color preference. That is, when colors are chosen for color's sake, entirely divorced from associations such as artistic usage, pure colors are predominantly preferred. Primitive races display their taste for pure colors in their dress and in their primitive art. Their languages contain words for only the conspicuous colors. Names for red appear in nearly all primitive languages; yellow is in most of them; green in comparatively few; and blue is rather rare. There still exists among civilized beings a tendency to confuse bluish green, blue-green, and greenish-blue, so that the necessity for fine distinctions between these colors should be avoided if possible.

Intelligence and culture are the results of associations. Taste, for example, is a development of civilization or culture. The infant of civilization possesses few associational ties. He is like a

primitive man in this respect. In fact, he is a primitive man in many ways. As the infant of civilized parents grows older he is taught and thus accumulates associations which combined are in reality what is termed education. Intelligence, taste, culture, etc., conspire toward complexity. The infant of uncivilized parents as he grows older does not progress far from his original mental state as compared with the infant of higher civilization.

In studying the environments amid which civilized beings choose to live, it is obvious that the purer colors are no longer preferred for large and predominant areas. Tints and shades of pure colors and shades of tints predominate. Thus absolute preference gives way to taste. For the sake of a name as opposed to absolute preference, the term relative preference is used here to indicate the preference as indicated by normal civilized subjects in which associations and all the complexities of civilized life play parts. However, the data already presented is of real value to the advertiser if he will use it with judgment based upon a broad view of the complex psychology involved.

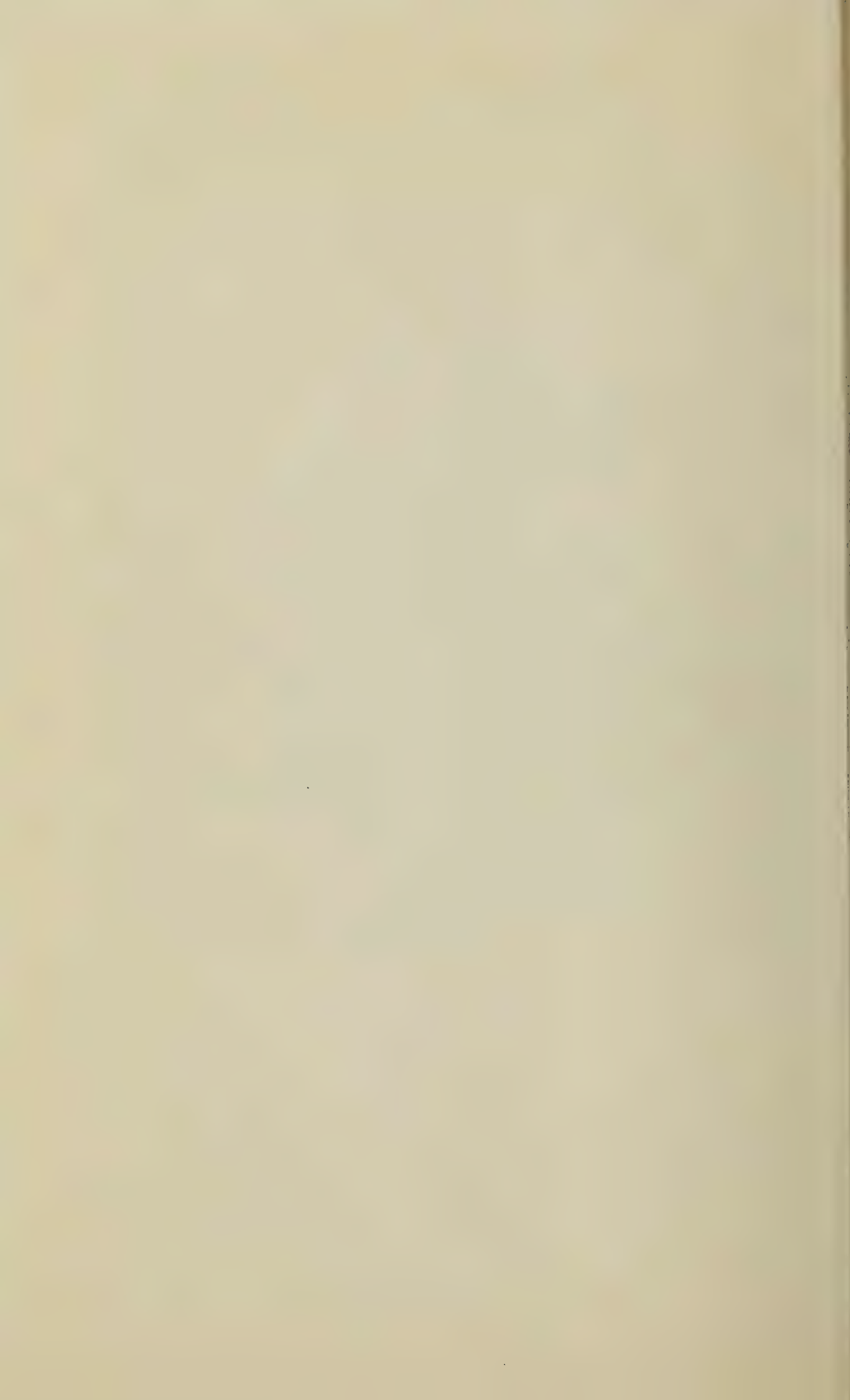
The data obtained in the investigation under consideration will be analyzed further. Owing to the confusion arising from the large figures representing the actual number of choices, the data



(Courtesy of The Sherwin-Williams Co.)

PLATE V

Paint is a wonderful medium from the viewpoint of variety of effects obtainable. Decorative schemes can play important roles in modern merchandising as well as in office, home and factory. In advertising the possibilities of paint, color is very essential.



have been reduced to percentages and preference orders. In Table II the results of the total preferences for each of the eighteen colors have been reduced to percentages of the average. For example, the sum of the figures in one column is approximately 1800, and there being 18 colors, the average number of choices would be 100 for each color. The actual numbers represent the

TABLE II. — PERCENTAGE OF AVERAGE PREFERENCE.

Color	Mean of 115 Males	Mean of 121 Females	Mean of 236 Subjects
Red			
pure	148	141	145
tint	104	80	92
shade	97	99	98
Orange			
pure	112	103	108
tint	56	89	73
shade	71	65	68
Yellow			
pure	93	91	92
tint	68	97	83
shade	55	44	50
Green			
pure	121	105	113
tint	70	94	82
shade	84	101	93
Blue			
pure	164	120	142
tint	117	112	114
shade	109	111	110
Violet			
pure	128	116	122
tint	94	119	107
shade	108	113	111

percentage of preference attributed to the respective colors by the averaged group of subjects. The mean values are presented to the nearest whole number.

It is seen in Table II that the pure color is always more preferred than the other two of the same group with the exception of two cases where pure violet and yellow were slightly less popular with the women than their tints. Even in these cases there is little difference between the rank of the pure color and its tint. In general, the colors near the ends of the spectrum (violet, blue, red and purple) are generally more preferred than the colors near the middle of the spectrum, namely, green, yellow, and orange.

In another experiment in which twelve pure colors were used, but only fifteen observers of both sexes, the order of preference for the colors was; deep blue, deep red, red, red-purple, blue, green, orange-red, yellow-green, orange, yellow-orange, yellow, lemon yellow. These results are not as dependable as those under consideration because of the fewer observers, nevertheless they check the conclusion that the colors near the ends of the spectrum and purple are more preferred than the others. This apparently is an established fact and speculation upon the reason for these results will not alter the facts. However, it appears that the preference order for pure colors is quite the

reverse of that indicated by our surroundings such as wall-coverings and furnishings which are of subdued colors, namely tints and shades. It appears that with the freedom from the ties of taste, the novelty of the rarer pure colors, blue, violet, and red, appeals to us in our elemental or "savage" state. Surely where color may be chosen in advertising without regard for anything else, the foregoing is a guide which if followed will result in the choice of colors of superior initial appeal and consequent attention-value.

In Table III the colors have been listed according to their order of preference. This permits of a quick survey, but the reader is cautioned that Table II contains the fundamental data. In Table III a whole step in rank is not of equal value in every case as will be seen in referring to the actual data in Table II. In Table III it will be noted that the pure colors predominate at the top and the tints and shades of mid-spectrum hues predominate toward the bottom. The pure colors are indicated by the name, and tints and shades by the addition of T and S respectively. A pure color, though preferred to its tint or shade, may be so low in the preference scale as to rank far down in the order of preference of the 18 colors. This is true of yellow, for example.

In Table IV the pure colors, tints, and shades have been separated and the preference order for each group is given. It is seen that the admixture of white (a tint) or the admixture of black (a shade) in some cases greatly displaces

TABLE III.—MEAN ORDER OF PREFERENCE OF 18 COLORS.
(*T* and *S* mean tint and shade respectively)

Rank	Mean of 115 Males	Mean of 121 Females	Mean of 236 Subjects
1	Blue	Red	Red
2	Red	Blue	Blue
3	Violet	Violet <i>T</i>	Violet
4	Green	Violet	Blue <i>T</i>
5	Blue <i>T</i>	Violet <i>S</i>	Green
6	Orange	Blue <i>T</i>	Violet <i>S</i>
7	Blue <i>S</i>	Blue <i>S</i>	Blue <i>S</i>
8	Violet <i>S</i>	Green	Orange
9	Red <i>T</i>	Orange	Violet <i>T</i>
10	Red <i>S</i>	Green <i>S</i>	Red <i>S</i>
11	Violet <i>T</i>	Red <i>S</i>	Green <i>S</i>
12	Yellow	Yellow <i>T</i>	Yellow
13	Green <i>S</i>	Green <i>T</i>	Red <i>T</i>
14	Orange <i>S</i>	Yellow	Yellow <i>T</i>
15	Green <i>T</i>	Orange <i>T</i>	Green <i>T</i>
16	Yellow <i>T</i>	Red <i>T</i>	Orange <i>T</i>
17	Orange <i>T</i>	Orange <i>S</i>	Orange <i>S</i>
18	Yellow <i>S</i>	Yellow <i>S</i>	Yellow <i>S</i>

the color from the position of the pure color in the preference order of pure color, nevertheless, the ranks are surprisingly consistent. It will be noted that the shade of yellow ranks last and that the tint and shade of orange rank very low.

TABLE IV.—MEAN ORDER OF PREFERENCE FOR HUES, TINTS, AND SHADES.

	Mean of			Mean of			Mean of		
	115 Males			121 Females			236 Subjects		
	<i>Pure</i>	<i>Tint</i>	<i>Shade</i>	<i>Pure</i>	<i>Tint</i>	<i>Shade</i>	<i>Pure</i>	<i>Tint</i>	<i>Shade</i>
Red	2	2	3	1	6	4	1	3	3
Orange . . .	5	6	5	5	5	5	5	6	5
Yellow . . .	6	5	6	6	3	6	6	4	6
Green	4	4	4	4	4	3	4	5	4
Blue	1	1	2	2	2	2	2	1	2
Violet . . .	3	3	1	3	1	1	3	2	1

A similar investigation though not extensive was conducted with the aim of obtaining definite data pertaining to preference for combinations of pairs of colors. Fifteen different colors were laid on a table and the subject was asked to choose the pair which he most preferred. Almost invariably this was a pair of closely complementary colors. After recording these colors they were separated and placed again among the scattered group. Another pair was then chosen by the subject, any color being used as often as desired. The pair was recorded and again separated and placed amid the group. This was continued until ten pairs were recorded. At least one-half of the pairs chosen were approximately complementary colors and rarely were combinations chosen which were close together in the spectrum or "color-circle." The color-circle is an arrangement of the spectral colors in their

regular order around three-fourths of the circumference of a circle. The order of the spectral colors is violet, blue, green, yellow, orange, red. The two ends are joined by a sequence of purples with red-purple at the red end of the spectrum and joining the violet end with a violet-purple. Plate II.

Area exerts an influence on preference and there is some indication that as the area increases, that is, as the space which the color occupies in the visual field increases, there is a tendency to prefer less saturated colors. This point is unestablished and has little value in considering color in advertising because advertisements occupy such a small portion of the visual field.

Certain sex differences are to be noted. For example, the female group preferred the pure red above all colors with blue second. The order is reversed for the male group, blue ranking first and the red second in the order of preference. This has been firmly established by other experiments. In fact, all the points emphasized in the foregoing have been corroborated by other investigations so that the general conclusions may be considered as thoroughly established.

It should be noted that the appearance of colors depends upon the illuminant and that the color-preference depends upon the appearance of the color. Owing to the great difference between

the character of daylight and that of ordinary artificial light, the appearance of a color or of a group of colors is generally quite different under these two illuminants.

Mistakes are commonly made by not taking this into account. The appeal of a color is altered to the extent that its appearance is altered under another illuminant.

SUMMARY ON ABSOLUTE COLOR PREFERENCE

The following are general conclusions pertaining to color preference when the colors are chosen for color's sake alone; that is, apart from any other consideration.

Pure or saturated colors are more preferred than tints and shades when colors are considered apart from anything else; that is, when colors are judged for color's sake alone.

Civilized man, infant, and savage exhibit in general the same absolute color preference.

The innate appeal of pure colors is generally much more powerful, at least, initially, than tints and shades.

Pure colors possessing hues near the ends of the spectrum are more preferred than those of mid-spectrum hues. That is, red, blue and violet and their tints and shades (also purple) have a stronger innate appeal than green, yellow, and orange and their modifications.

These absolute color preferences are quite opposed to those resulting from taste. That is, when colors are judged in connection with their use and combinations, in other words, when the elements of taste and culture enter, the tints and shades are chosen which are least preferred under the other condition or basis of judgment.

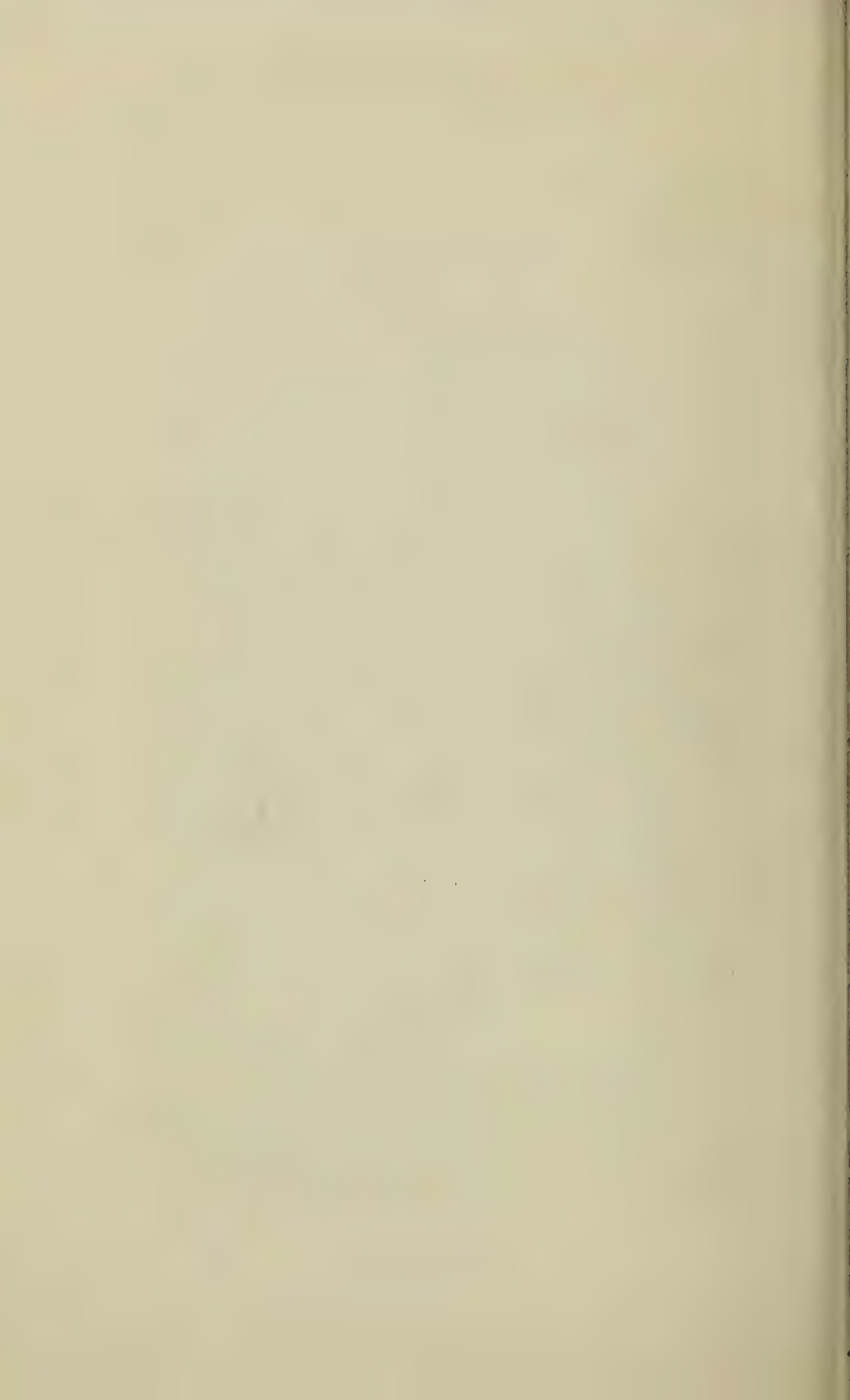
There are various possible reasons for this preference for pure colors such as blue, violet and red, but the simplest and apparently the strongest is that of novelty. These colors of high purity are relatively rare amid everyday environments. When they do occur they usually occupy very small areas or very small portions of the visual field.

In advertising, wherever color is used merely for color's sake without any relation to taste or harmony or to the description or application of the advertised product, the choice of colors should rest largely upon the foregoing absolute color preferences. This would be true in such cases where a spot or border of color on a page is used solely to attract attention; in the case of a color for a package, symbol or trade-mark; and in many other applications of color in advertising. If the pure color is too dark to be seen distinctly at a distance or under poor lighting conditions it is well to compromise to some degree by using a deep tint.



PLATE VI

Here color is not only decorative but adds realism to the product and emphasizes waning natural light.



The most generally preferred pairs of colors consist of complementary colors. Pairs of colors possessing hues close together rank low in the scale of absolute color preference.

Blue is more strongly preferred than other pure colors by men with red a close second. Red is more strongly preferred by women with blue next and violet closely following.

RELATIVE COLOR PREFERENCE

Color preference of the relative type may be studied upon every hand. The use of color as influenced by taste, habit, intelligence, environment, etc., is evidenced in decorations and furnishings of interiors, in everyday dress, in painting, etc. The choice of color in advertising may be safely based upon the artistic sensibility or the taste of an individual if he is certain that his sensibility and taste are representative of the group to which his advertising is intended to appeal. Scientific investigation is not as necessary in this field where artistic sense is involved. Daily observation and studies of taste and harmony of color and appropriateness will yield the data necessary.

CHAPTER IV
EMOTIONAL VALUE

ABSOLUTE color preference, as has been shown, is capable of scientific determination and analysis. In such studies of the innate appeal of colors the problem is not rendered complex by associations and past experiences. Individuals may be considered to react in the same general manner if they are capable of eliminating the influence of such factors as past experiences, associations, habit, superstition, and symbolism. The study of the emotional or affective values of colors is quite the opposite, for here are encountered all the complexities due to the conspicuous differences among individuals, because each has acquired so many and so varied emotional and sentimental attitudes toward various colors.

Individual experience and temperament are very important factors which are responsible for variations among individuals; however, if viewed in a broad manner, a general consistency is usually perceptible in psychological experiments with light and color provided sufficiently large

groups of subjects are used. An occasional individual may have had some disgusting or sorrowful experience with which a certain color remains associated in his mind. His attitude toward this color will be quite different under some conditions than that of a person who has had an experience quite opposed to his. Unless some powerful influence is superposed the different reactions of the two persons toward the same color will be confusing. In order to iron out these strongly individualistic reactions it is necessary to use a sufficiently large group of subjects in any experiments pertaining to the affective value of color.

Colors and their combinations may be agreeable, cheerful, stimulating, neutral, tranquilizing, depressing, warm, cold, stern, stately, weak, or impressive. These are factors which may well be considered in color-schemes for advertising purposes. A few of the more common examples may be of interest at this point.

Red is characteristically a stimulant or excitant. It has been shown that more work of a certain nature was done by subjects in a given time under red light than under ordinary light. However, it is not recommended for constant use any more than other stimulants. Incidentally it should be recognized that color in illuminants is generally much more powerful emotionally than color in objects. In the case of light the color

alters everything upon which it falls. In the case of color in objects the reflected light which is colored does not noticeably influence everything else in the vicinity unless the color is on great areas. For example, all the surfaces in a room including the objects must be colored exclusively in red of various tints, shades, and pure color in order to obtain the same effect as would obtain with the use of red light.

Recognizing the stimulating or exciting effect of red, this power can be regulated by varying the saturation and the value or shade. Perhaps just the required enlivening effect for a given purpose may be obtained by a medium tint. In another case a delicate tint may be just sufficiently stimulating. A light tint of reddish purple, commonly called rose, is delightfully enlivening and may be suitable for certain occasions in dining and living rooms or in ballrooms and restaurants, though this hue is not suitable for a quiet study. The merchandiser can determine for himself whether it is best to use colored pigments or colored lighting for his particular case.

Orange and yellow are mildly stimulative and are best described as warm colors. It is interesting to note that tints and shades of yellow are the colors most widely used in interiors. Doubtless this usage has arisen from a desire to make the interior cheerful and inviting. The residence

plays the fundamental role of protector. It shields us from cold, heat, rain, wind, and also from dangers. It is a symbol of comfort. Incidentally the color of most early illuminants has been a warm unsaturated yellow. These influences have naturally led to a desire to alter modern illuminants to a warm yellow tint. However the mistake is commonly made of using amber for this purpose for its hue is greenish yellow which is not generally pleasing for illumination. There is plenty of evidence to show that a light tint of greenish yellow is not popular and that as an illuminant it is very undesirable for general use. Sometimes during hot weather, interiors in which the illuminant or the dominant note of a decorative scheme is of a deep yellowish tint, are seemingly uncomfortably warm.

Green is most generally characterised as a neutral color perhaps due to continued adaption to large areas of this color in nature. Nature's greens are darker or deeper in shade than commonly realized. Although green is a restful color and therefore generally agreeable it can be very disagreeable. For example, green light may be a beautiful note in a lighting effect but when we view the human face under this light it usually becomes very disagreeable.

Blue is serene, cool, cold, sedate or depressing depending upon its tint and hue. The further

it departs from green the more it departs from neutrality or serenity until it can become depressing. It arouses certain emotions which can be traced to the part that the sky has played as the abode of God and of Knowledge. Its dominating presence in many landscapes perhaps has led to the feeling of harmony which it sometimes induces. The psycho-physiological effect of coolness or even of coldness of blue and blue-green is sometimes undesirable although these attributes are also useful. For example, how much more inviting and comfortable a theatre appears in midsummer when finished in cool colors or when illuminated by light of a blue-green tint. Even the summer seat-covers of a bluish tint contribute to the effect of coolness. There are many such applications for the coldness of certain colored illuminants. Incidentally, in most of the applications of colored light for general lighting, tints whose effects are felt but scarcely seen are more generally desirable than illuminants giving purer colors, although the latter have a certain spectacular value. The lack of recognition of the greater power of tinted light over the same tint as would be used in the decorative scheme has led to many uses of colored lights too pure in color.

The emotional value of black and of darkness is experienced by everyone. It suggests mystery

and even fear is aroused. Due to its association with death it also has certain powers. It is dignified and of great decorative value.

White is the antithesis of black. It is even more conspicuous in many cases than black. It suggests cleanliness and purity. It suggests a void or nothingness just as black does. It provides the extreme of contrast when used with black. It is the most luminous of colors but does not suggest light as generally as a tint of warm yellow. It is coming into some disrepute in hospitals, restaurants, etc., for it is harsh. In many cases, even in the backgrounds of some advertisements, it is best to subdue it to a very light gray or light tint.

The emotional value of grays lies between black and white. There is a certain dignity to gray. It is usually considered neutral but it is sometimes slightly depressing and usually more restful than white. In fact, its emotional value is usually far from neutral. In the making of gray it is common to mix black and white. This generally results in a bluish gray which is decidedly cool and less pleasing than a gray with a slight warm tint. Many shadows are either gray or deep shades of tints. This must be recognized in analyzing a lighting effect.

With a little practice and a careful discrimination of the shades of meaning of words em-

ployed, any intelligent individual may analyze his own reactions toward different colors. A typical case might be as follows:

Crimson, vague impressions of passion, blood, or danger. Exciting or over-stimulating.

Orange, hot, irritating, even suffocating.

Orange-yellow, warm, glowing, lively.

Yellow, joyous, gay, merry. Or upon the entrance of another association, it may be sickly and disgusting.

Green, peaceful, neutral, virile.

Blue, sedate, sober, cool, tranquil.

Violet, stern, gloomy, melancholy.

Purple, stately, pompous, impressive.

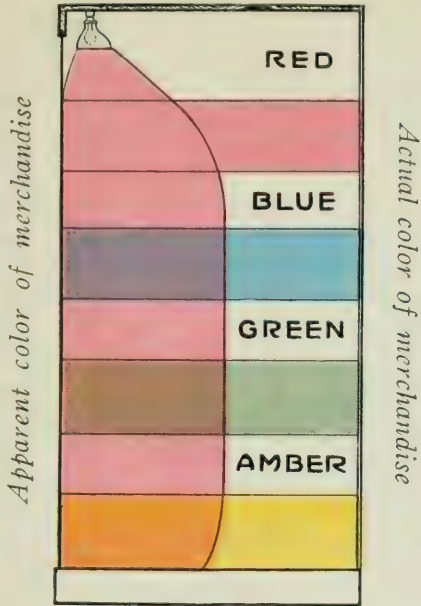
In any study of the emotional value of color it is well to recognize the various types of answers given by the subjects; that is, the general channels through which colors impress human beings. The important aspects are as follows:

Objective aspect: The purely physical characteristics of colors, such as brightness, richness, saturation, delicacy, fadedness, muddiness, irregularity, may be the basis of their appeal or lack of appeal.

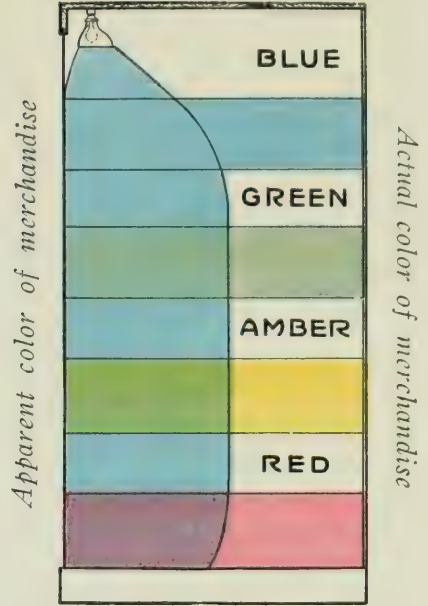
Physiological aspect: Colors may affect observers physiologically. They may be agreeable, unpleasant, sickening, enlivening or enervating.

Associative aspect: This represents the suggestive powers of colors and the associations aroused

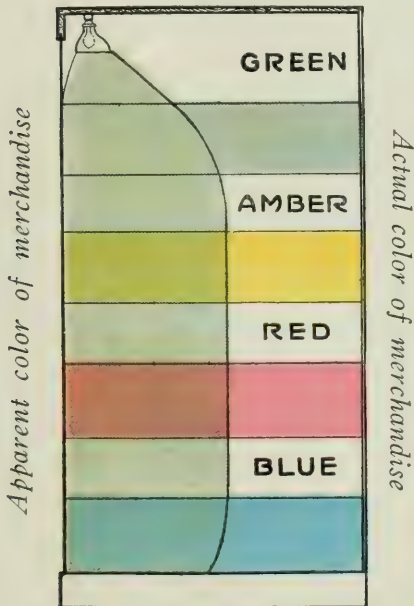
The Effect of Red Light on



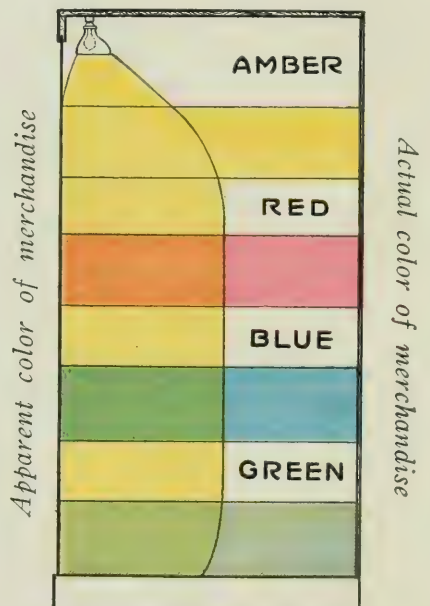
The Effect of Blue Light on



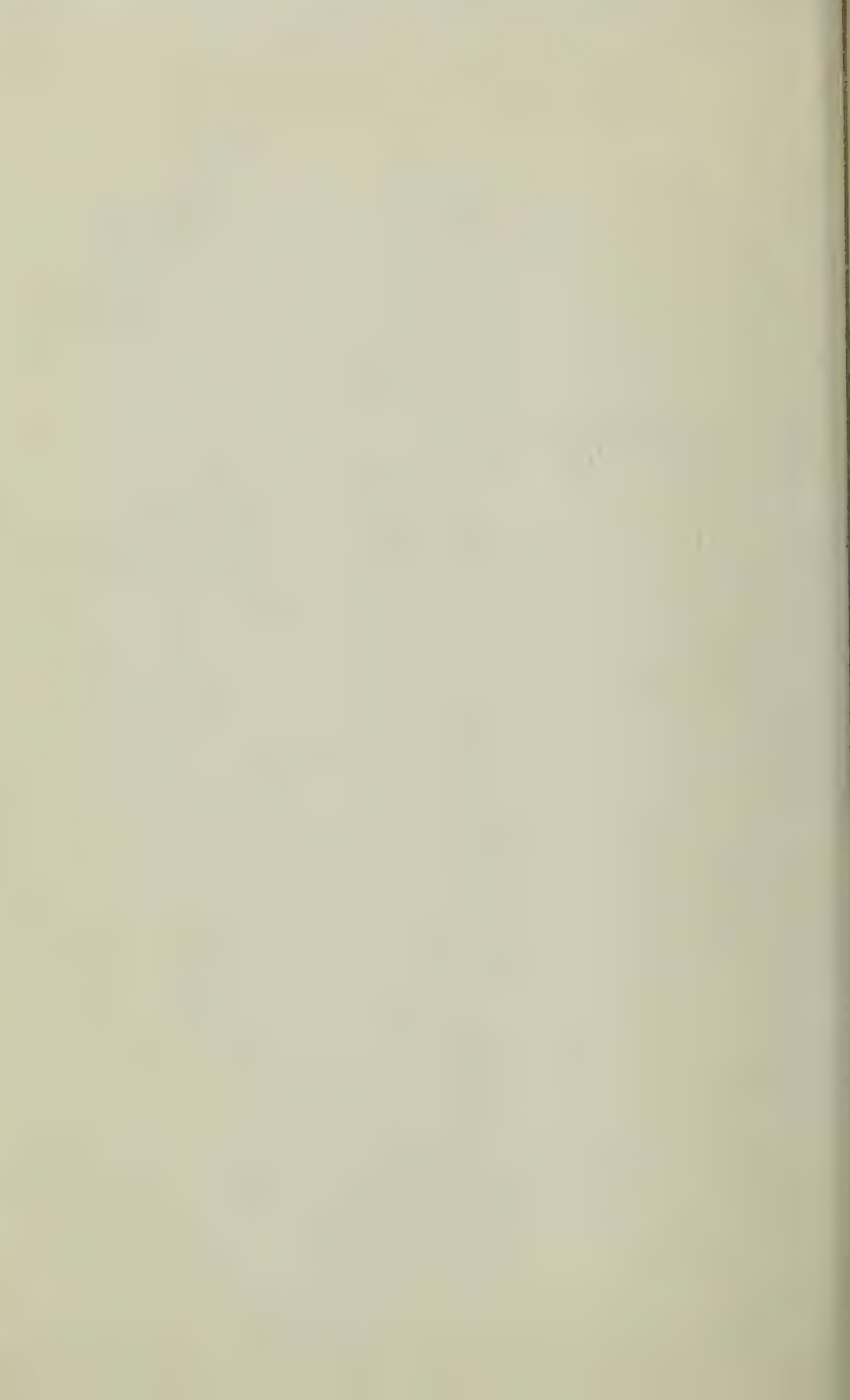
The Effect of Green Light on



The Effect of Amber Light on



(Courtesy National X-Ray Reflector Co.)



will indicate consistency for a large group of persons. Of course, there will be exceptional associations peculiar to an individual's exceptional past experience with the color.

Character aspect: This includes the self-expression of a color which in the case of a human being corresponds to his character, mood, or temperament. This is a complex group which is very important. It is the field that has barely been invaded by explorers. The effects of colors in this direction are free from personal factors, accidental memories, and irrational associations. This is the emotional side of the impressiveness and expressiveness of colors and this form of color appreciation is of the highest rank esthetically. The appeal due to character aspect is deep and subtle and therefore most difficult of analysis.

A typical experiment will illustrate certain emotional values of colors. A large group of subjects of both sexes was chosen and twelve different colors were presented to the group simultaneously on a large chart.

The colors were placed in their spectral order upon a gray background and a list of twenty adjectives was displayed on a blackboard. These words, though arranged in a haphazard manner, could be grouped into three classes indicating those colors which were respectively exciting,

tranquilizing, and subduing. The subjects were required to write one of these adjectives (or any other that occurred to them) which expressed the feeling or mood suggested by each color. The words were to indicate why they liked or disliked the various colors. The data obtained from a group of 63 subjects (college students) about equally divided as to sex are given in Table V.

The general results from this experiment are substantiated by many other researches and observations. Such data establish the emotional values of colors upon a scientific foundation. The results indicate no marked sex difference but seemed to show, as some other experiments do, that the development of color perception or sensibility is more complete among women than among men. In visualizing the results it is helpful to think of the "color-circle" around three-

TABLE V.—TOTAL NUMBER OF REPLIES FROM 63 COLLEGE STUDENTS INDICATING THREE GENERAL INFLUENCES OF COLOR.

Color	Exciting	Tranquilizing	Subduing
Crimson	41	0	10
Scarlet	56	0	0
Deep orange	59	0	0
Orange-yellow	55	6	0
Yellow	53	6	0
Yellow-green	14	39	5
Green	28	32	0
Blue-green	32	23	6
Blue	11	21	30
Violet-blue	0	17	45
Violet	0	6	54
Purple	3	1	48

fourths of which the spectral colors are distributed in their order, the remaining gap filled with purples. The chief colors in their order in the color-circle are as follows: Deep red, crimson, orange, yellow, green, blue, violet, bluish purple, purple, and reddish purple. The colors in which orange and red are predominant, are seen to be exciting. This influence again begins to appear in purple and has also been found to increase toward the reddish purple. It reaches its greatest strength in scarlet and deep orange and begins to decrease with the deepening of the red. The tranquilizing region extends from yellow to violet reaching a maximum for yellow-green and green. The subduing influence is confined chiefly to the violet region but begins to appear again in the deep red. It is interesting to note the uncertainty in the replies for the middle or tranquil region of the spectral colors.

The same general effect is obtained for tints and shades although the range of tranquillity increases. Likewise the range of uncertainty in the replies also increases in this region. In general, the admixture of black to pure colors (shades) reduces the exciting influence and increases the subduing influence. Naturally the range of tranquillity also increases. Other experiments support these various conclusions.

The influence of suggestion is readily shown by

experiment. For example, a tint or weak color might be termed "faded" or "delicate." The effect of the two opposed suggestions may be detected with the result that verbal suggestion may be said to have a decided positive effect on the judgments of observers of colors.

The various emotional values may be judiciously employed in advertisements. Color schemes may aid in arousing the feeling of pleasantness or unpleasantness, excitement, or tranquility, brightness or gloom, etc.

If agreeableness is to be associated with the advertised product, appropriate colors may be employed in depicting the product or its use. And this effect may be augmented by that universal influence — contrast — by placing the product in a depressing color environment.

Knowing the powers of colors, the advertising specialist may draw upon them to depict his products in the best cloaks of color and to emphasize these by utilizing opposed colors for the environment. Paintings possess their powers largely by virtue of the choice and distribution of brightness and colors.

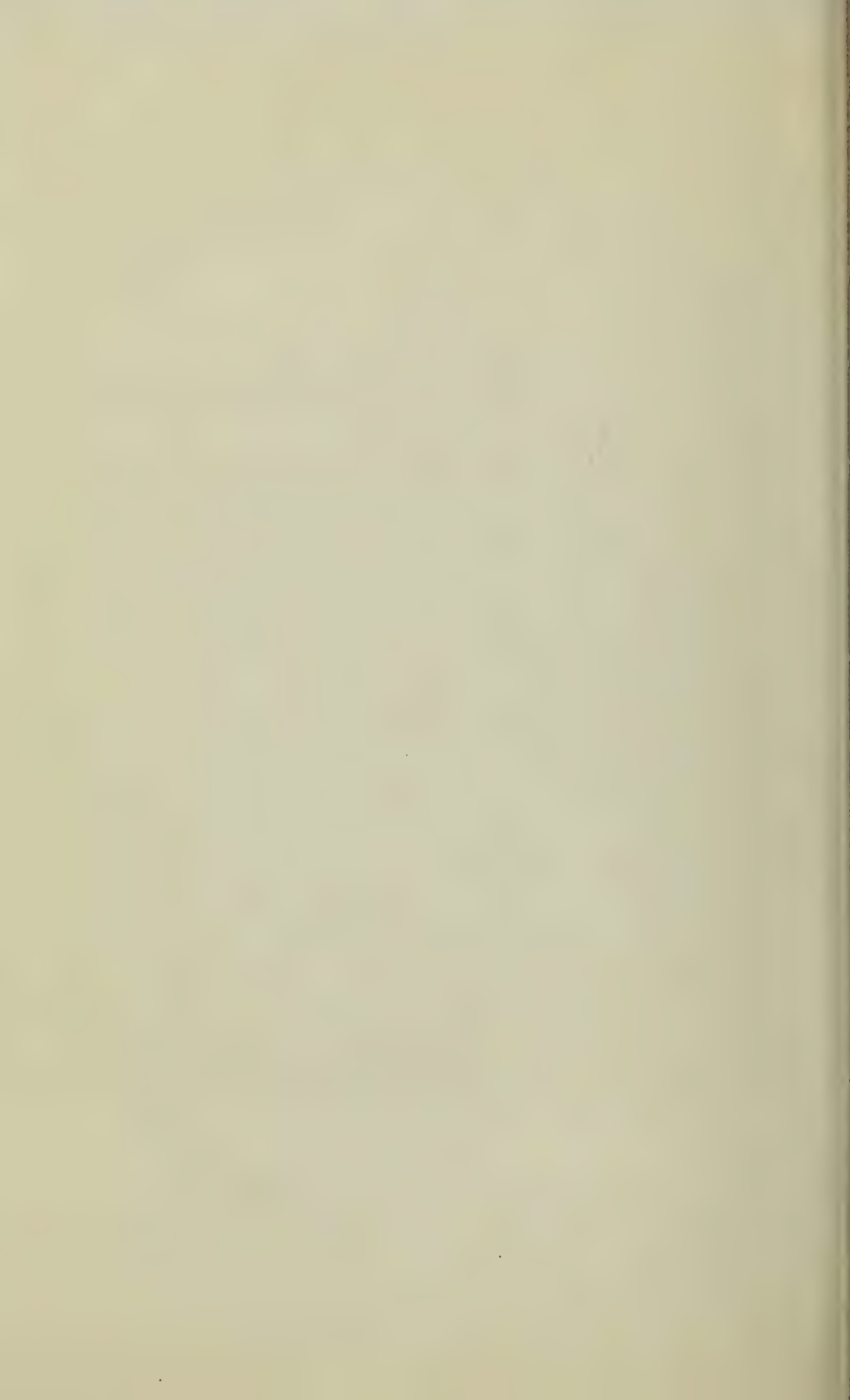
Fatigue exerts an influence upon the emotional values of colors. A momentary glimpse of a pure color may be very appealing but when sufficient time has elapsed for association to arise, the color may become repellent or depressing. Certain



(Courtesy of The Handel Co.)

PLATE VIII

Color not only lends realism to the materials and decorations of a portable lamp but also aids in depicting the environment. Color-printing can also alter the white page of the insert to a more harmonious tint.



colors may be very striking and appealing but to live with them as prominent factors in decorative schemes would be unbearable. Fatigue usually plays little part in advertising but there are kinds of advertising in which the same copy with the same color-scheme greets the public day after day. This is also true of special lighting effects. In such cases the influence of fatigue should be considered. In the ordinary advertisement which is not studied, the momentary appeal is perhaps of greatest importance. A group of pure colors is attractive and the colors are a feast for the eyes, but to live with them constantly would be like living with a brass-band.

There is some indication that violet, blue and green "wear" better than yellow, orange and red. That is, the former group is less influenced by association and adaptation than the latter group. Associations appear to be somewhat favorable to tints and shades; but mere adaptation without the arousal of associations appears to be somewhat unfavorable to them. Too definite conclusions regarding these finer points are dangerous at the present time owing to insufficient data, but the information available indicates the general trends at least.

It is interesting to note that when a color is agreeable *we* occupy the center, but when it is beautiful the *color* occupies the focus of attention.

This is helpful in any analysis of the effects of light and color. When we occupy the attention in respect to a color we are dealing with the impressiveness of color. When the color is beautiful or rich, for example, the color occupies the attention and we are dealing with the expressiveness of color.

CHAPTER V

SYMBOLISM

THERE are many sources of information pertaining to the impressiveness and the expressiveness of color. The symbolisms of light and color are numerous and they are intricately interwoven with the creeds, customs, fortunes, and states of civilization. These symbolisms have been perpetuated in mythology, in literature and by usage although undergoing slow modifications as centuries passed. This subject has been discussed in detail elsewhere¹ and will be touched upon briefly here. Anyone who is observing will find many applications of the symbolisms of light and color in merchandising. They have their use in advertising, in lighting, in trademarks, in insignia, and in the various other media of modern merchandising. The use of light and color according to established symbolism insures effectiveness not generally realized by haphazard choice.

Nature has influenced mankind from the dawn of the human race and the colors of nature have

¹ The Language of Color, by M. Luckiesh, 1918.

become associated with various ideas and moods and have assumed certain attributes and symbolisms. Green of growing vegetation has become symbolic of life and by extension is related to memory. Green, being indicative of life, is responsible for the association with "evergreen" of the idea of memory kept alive. The colors of harvest suggest fruition and plenty. The browns of autumn are somber and saddening because they attend the decay of summer, the life of the year, and they prophesy its approaching death. Contemplation of the severe months of winter and the dreary waiting for another spring perhaps add to the saddening effect of autumn. In a similar manner, the various colors conspicuous in the different seasons have assumed certain appropriate attributes.

The blue sky is emblematic of serenity. Mythology made the sky the abode of the divine spirits and naturally the color of the heavens acquired the attribute of divine intelligence. The gray leaden sky is depressing. The sunsets — those glorious benedictions — with their variety of tints but characteristic dominating colors, have contributed to the language of color.

From such sources as these, many attributes of color became woven into the more or less vague imaginings of mythology. In the early childhood of the human race, fancy was rampant. The

world was peopled with supernatural beings; inanimate objects were endowed with human powers; and inaccessible or unusual places were the abodes of the gods. Colors received their share of attention and many fanciful attributes were originated. Thus glimpses are revealed of the impressions which colors made upon the intellects of the early peoples. The crystallization of these impressions into the permanent and recognized usage of the present time may be witnessed on every hand. Doubtless, the attributes which the colors were supposed to possess were very real to many, but even though they were originally bestowed through mere fancy, they have acquired by continued association and common consent some degree of signification similar to words. The attributes which colors acquired in mythology have persisted in modern literature and the fine sensibilities of the poets have added more.

Primitive languages show a scarcity of color-names and therefore some difficulty is experienced in interpreting various meanings. However, this scarcity tells us something in regard to the primitive taste and intellect. This is valuable because it has been shown that even modern civilized beings are primitive in response to colors when associations are eliminated or subdued. In nearly all primitive languages red appears and in general

red is the first color-name to appear. Yellow is found to rank next in prevalence. A color-name for green is found in comparatively few of the languages of lower civilizations and a name for blue is usually lacking. In general it may be considered that color-nomenclature begins with red and progresses toward the blue end of the spectrum. In the early stages of the evolution of color-names the transitional colors such as orange and blue-green are not developed. Even today with our highly developed color-sense most persons confuse bluish-green, blue-green and greenish-blue. Our own language is far richer in abstract names for the red and yellow regions of the spectrum than for the blue region.

Primitive beings often use the same name for colors associated closely in the spectrum, such as yellow and orange or blue and blue-green. They also use the same name sometimes for dark colors such as black, blue, and violet. This probably means a lack of distinction to some extent but more likely the absence of necessity. Doubtless the visual sense of primitives is able to discriminate but the finer feeling toward colors is absent. Taste and sensibility depend upon the intellect and culture of beings and this means the state of civilization. Environment has been an influence upon the sensibility of the human organism to various colors and doubtless upon the introduction

of color-names. However, indolence is a common characteristic of the primitive and therefore his inventions are chiefly the result of necessity. Therefore he created color-names largely only when they were necessary.

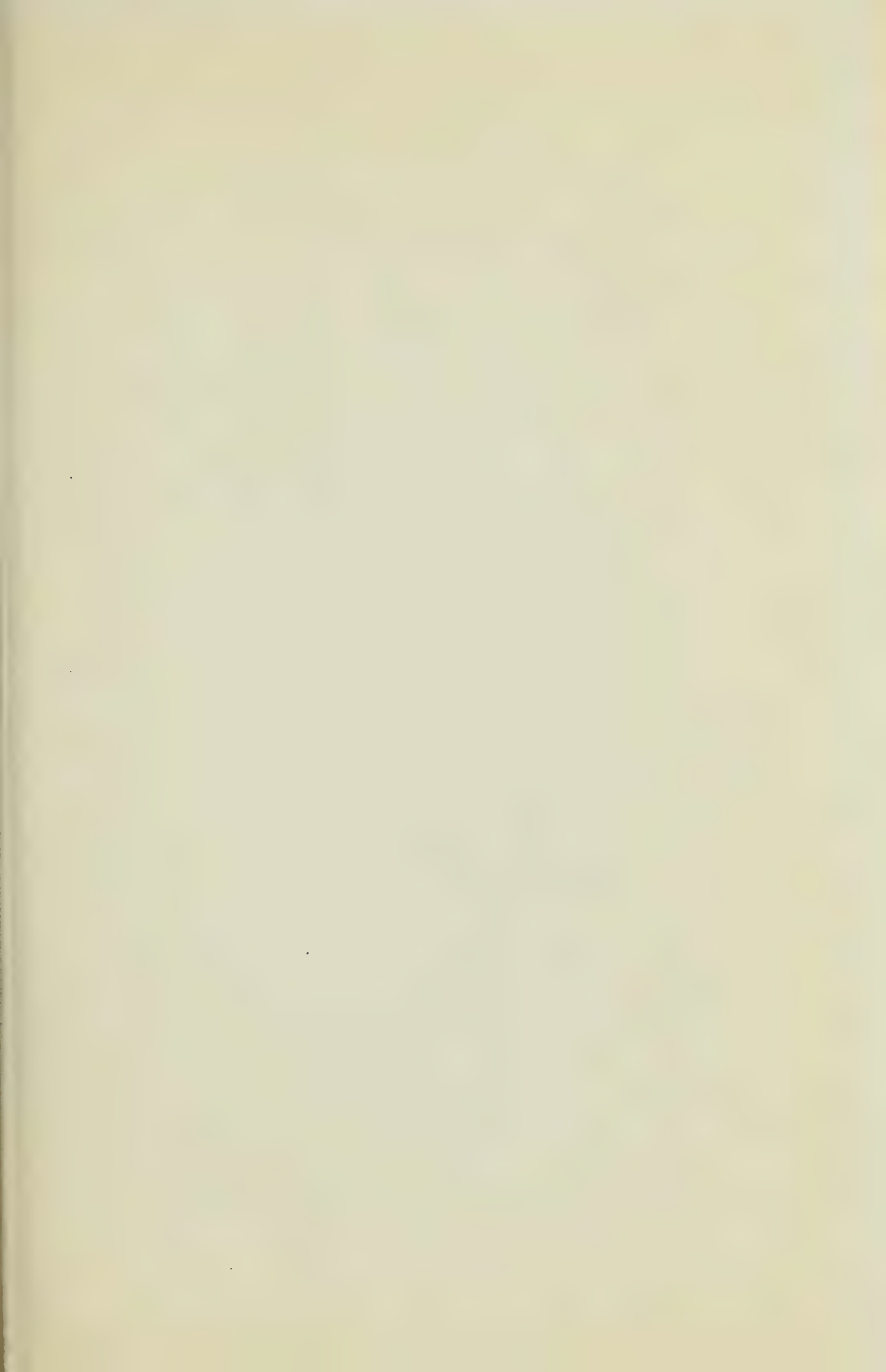
Of course, red is relatively rare in nature and therefore when it occurs it attracts attention. The relatively rare occurrence of red perhaps has something to do with its early introduction into language. On the other hand red is associated with food such as fruits and flesh which may account for its early receipt of a name. Green of foliage and the light blue of the sky are very common in nature and therefore may not be startling enough to receive a name as early as red. The variety of greens perhaps accounts for naming of green before blue because the latter exists in nature relatively rarely excepting for the sky. Little necessity for discrimination of blue and its scanty usefulness possibly account for its rare occurrence in primitive language. The sky or heaven is mentioned at least four hundred times in the Bible but the blue color is not mentioned. In the many descriptions of the sky in the Vedas the fact it is blue is not introduced. In the Rigveda the earth is nowhere described as green with vegetation and the sky is not indicated as being blue.

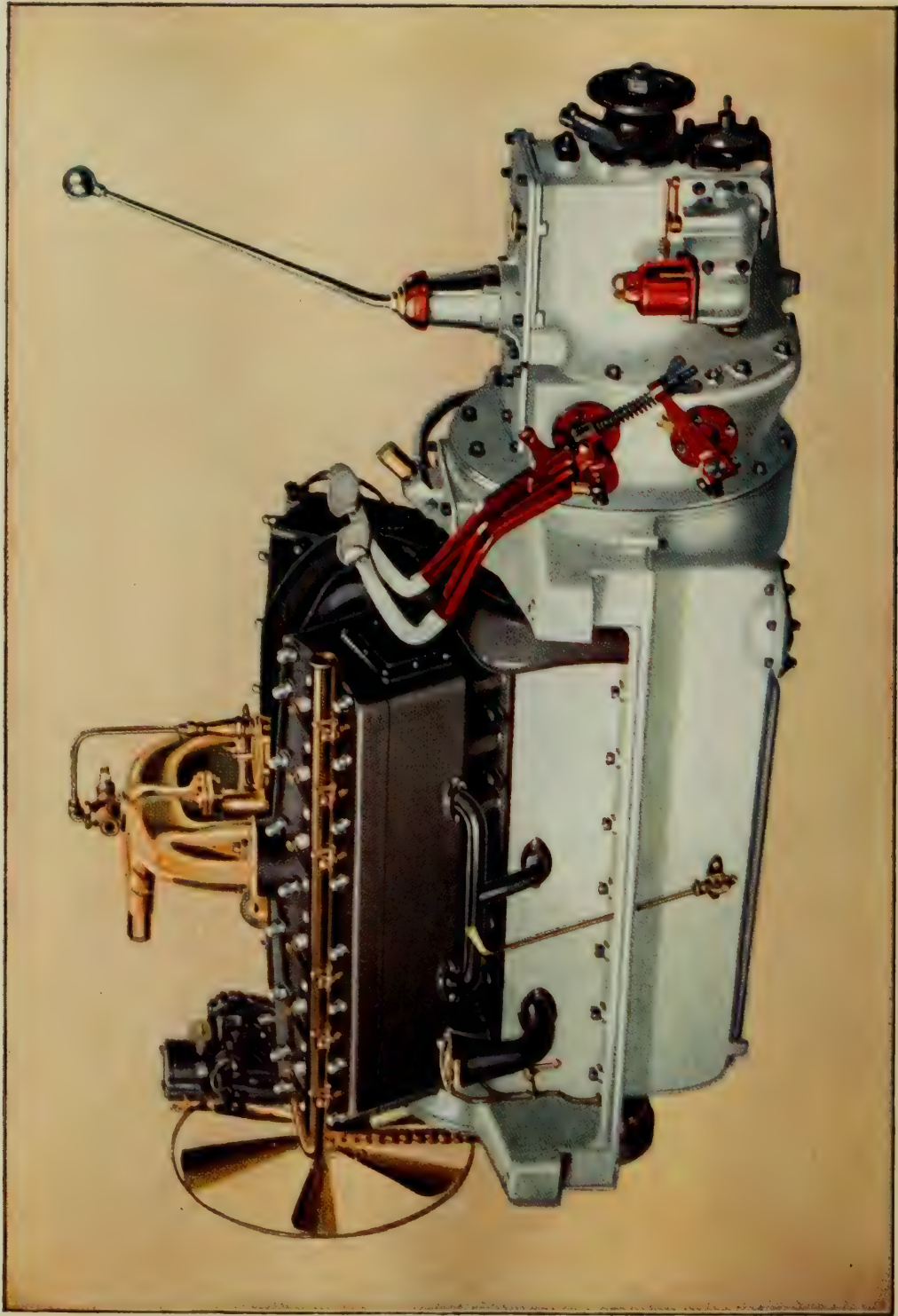
Notwithstanding this scarcity of color-names

there is little doubt that the colors of abiding places of gods and mysteries such as the sky, the earth, the sea, the mountain top, and the clouds impressed early beings. Many of the characteristics bestowed upon colors at the present time owe their origin to the imaginings of early peoples who lived at the remote periods or live under present conditions where knowledge is too scanty to curb their fancies.

Ecclesiasticism has played its part for the ecclesiasts in bygone centuries ruled with an iron hand. They established the symbolisms of light and color in their rituals. They dictated the colors to be used in their religious ceremonies and the uses and meanings of lamps. They chose the colors of biblical paintings to some extent and commandeered the artists to execute them. Much of this symbolism was adapted from early writings and usages although some of it grew from the mandates of powerful ecclesiasts. Many of these adoptions were introduced into episodes which formed the basis of the creed. Thus there arose within the church a further standardization of the use of light and colors and these symbolisms have been perpetuated by various means. The history of any creed is replete with symbolic uses of light and color and sometimes the establishment or the modification of usage is recorded.

The theatre began with a considerable heritage





(Courtesy of Champion Coated Paper Co.)

PLATE IX

of standardized symbolism or expressiveness of color. In the centuries when the theatre was devoted to art, it utilized this language of color to the extent possible by the means at hand. In modern times when commercialism has sacrificed art on the stage, the development of the effectiveness of the deeper characteristics of color has been greatly sacrificed. The Greeks used colors appropriate to their subject and even attempted to use colors significantly. There are many such attempts in the past but too few at the present time. The use of color on the stage is pregnant with possibilities, but in few cases are the color effects in the hands of persons possessing the necessary depth of knowledge and the sensibility to extract from color much of its latent power. Only occasionally is there a stage artist who directs his efforts toward the utilization of every expressive and impressive medium; then light and color receive their deserving opportunity to display their psychological powers.

Every-day utilitarian use has contributed to the standardization of color usage. Even the cheapness, prevalence, and permanency of coloring media have played their part. Throughout the run of centuries colors have thus accumulated attributes which form the rudiments of a language of color. These symbolisms should be known to those interested in merchandising. It is beyond

the scope of the present chapter to deal at length with these various sources of information. They may suggest to the advertising specialist, the merchandiser, and others the extent of the importance of light and color and how generally color, particularly, has become woven into the thoughts and activities of mankind. With these introductions perhaps the reader will understand more clearly the abbreviated statements of symbolisms of light and color which follow. In this concise treatment there are various seeming contradictions but these could be clarified if it appeared advisable to introduce the many necessary qualifying and explanatory statements. Inasmuch as the subject has been extensively treated elsewhere it seems best to be as concise as possible in recording the symbolisms. In the following it should be recalled that there are many variations in the appearance of a color to which a general color-name has been applied. For example, yellow is the name loosely given to many tints and shades and to variations in hue from greenish yellow to orange. This accounts partially for the variety of symbolisms. Some indications of the influences of tint, shade, and variation of hue are presented but these cannot be treated in detail without wandering far afield.

BRIEF SUMMARY OF SYMBOLISMS

Red has symbolized charity, martyrdom for faith, fire, heat, war, cruelty, anger, hatred, power, valor, passion, destruction, bravery, strength, blood, danger, revenge, falsehood, Satan, tried manhood, prowess, and anarchy. It has dyed the robes of royalty and martyrdom. As the Roman signal of battle the red flag led many warriors into battle. The heroes of old such as Scipio and Hannibal wore red shields. In the Greek church it has been favored for Lent and in the Roman church it has prevailed on the festivals of martyred Saints. It is prominent in Chinese religion and customs and is used by this race for marriage service. Tints of red have gentler offices symbolizing love, truth, health, beauty, bashfulness and Cupid. The red flag or red light is associated with blood, danger, and anarchy. Throughout mythology and the records of warfare, red has symbolized the flow of blood, the sterner qualities of mankind, and the more extreme passions and vices.

Orange has offices such as would be expected of a color between red and yellow. The characteristic in any case depends upon its nearness to yellow or to red. Orange or brown in the darker and less beautiful shades are sometimes used as emblems of distrust and deceit. Browns may be

generally considered to be dark shades of orange or of hues near it. When brown inclines toward red and black it is grave and signifies strength, solidity, vigor, and even sadness. The browns, as the colors of autumn, denote harvest and fruition.

Yellow in its pure state and brighter tints is emblematic of gaudiness, gaiety, lustré, enlivenment, light, warmth. Gold with its additional qualities of brilliancy and metallic lustre symbolizes glory, power, wealth, richness, splendor, sanctity, divine light, divine origin. In China yellow has been employed as a regal and a sacred color. Modifications of yellow such as shades and greenish tints are emblematic of distrust, deceit, indecency, morbidness, decay, cowardice, jealousy, inconstancy, sickness, disease. Thus yellow is used to clothe various malign passions. We hear of yellow journals, the flag of quarantine, and the yellow streak. Dingy yellow is often given to the garb of Judas and it has been used to mark the abodes of traitors and other criminals. Saffron has been applied to confessors.

Green signifies life, vigor, immortality, memory, resurrection, faith, hope, victory, cheerfulness, plenty, the spring of life, youth and inexperience. In a few instances, especially in early history, green has been a sacred color. Olive, a shade of green, is symbolical of solitude and peace. In the

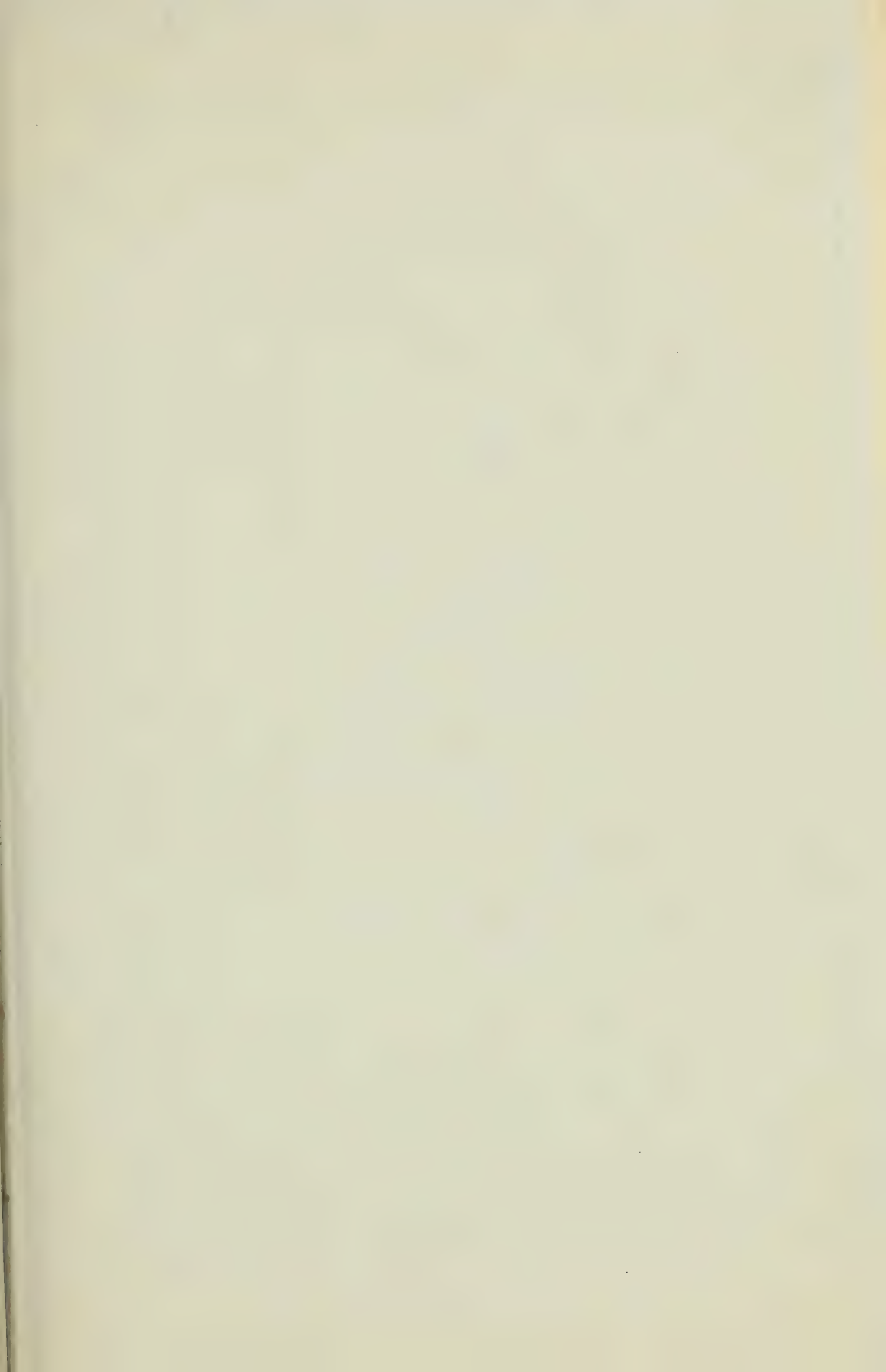




Plate X—Modern reflectors, colored accessories, and spotlights have placed the wonderful powers of light in the hands of the display-artist. (Courtesy National X-Ray Reflector Co.)

church its use on certain festivals signifies the rejoicing of the faithful. Much of its symbolism has apparently arisen from its prevalence in vegetation, especially in spring and in early summer. The poets have used this color extensively according to analogy, fancy, and to its use in nature. Green is also associated with depths of water. Pale green has been used in church to symbolize baptism. When this color is tinged with yellow it assumes some of the attributes of yellow. Likewise when tinged with blue its symbolism begins to show the influence of blue. It is a good example of the depth of significance a color can acquire in the traditions of a people for it means much to the Irish people. Its pure symbolic uses are not as numerous as might be expected but this may be due to its proximity to neutrality. Saturn is crowned with evergreen, and the hair and garments of Neptune, the Dryades, and the Naiades are dyed with green.

Blue, largely through its quality of coldness and proximity to black, is symbolic of dignity, cold, sedateness, solitude, and even sadness. It is soothing, subduing, and even depressing, depending upon the hue, tint, and shade. Through association with the sky or heaven it is symbolic of hope, constancy, fidelity, serenity, generosity, intelligence, truth, piety, wisdom, thought, Christian prudence, serene conscience, divine contem-

plation, and love of divine works. Blue has been used in many representations of biblical works. The veil of Juno, the goddess of air, is blue. Christ, St. John, Isis, Minerva and others are often represented in mantles of blue. The sky is a tint of blue, usually a pale blue. This must be taken into account when studying the symbolisms arising from the blue of the sky. To this color the attribute of harmony is sometimes given. The color of many shadows outdoors is often bluish owing to the fact that the light in the shadows cast by objects intercepting direct sunlight comes from the sky. This bluish tinge of shadows perhaps aids in the bestowal of the characteristic of solitude and loneliness upon blue.

Purple has acquired a symbolism befitting a color which lies between blue (or violet) and red, and depending upon the preponderance of red or of blue. It symbolizes royalty, stateliness, pomp, sedateness, dignity, wealth, richness, and power. It has been used for the robes of Jupiter, Apollo and others. It is sometimes a symbol of heroic virtue and the Babylonians clothed their idols in it. Amethyst and violet (as understood by most persons) are tints and shades of bluish purple. They have symbolized suffering, passion, love, truth, and martyrdom. Christ wears such a color after the resurrection and the Madonna after the crucifixion. It signifies penitence in connection

with the figures of saints. Rose is a tint of reddish purple. Although it has signified martyrdom it has a symbolism in accord with pleasanter attributes. It signifies love and beauty as discussed under the symbolism of red. Cheerful persons are said to see through rose-tinted glasses and persons in very good health are said to be in the pink of condition.

White naturally symbolizes light, purity, truth, chastity, innocence, peace, modesty and virginity. It is synonymous to unadulterated, unchanged, or undiminished light and its attributes are quite opposed to those possessed by black or darkness.

White was sacred to Jupiter; white horses drew his chariot and white animals were sacrificed by consuls who were clothed in white. The white vestments of priests are emblematic of peace and purity and this color is used at many religious festivals. Worn by the judiciary it symbolizes integrity. The white lily is dedicated to virginity, truth, purity, and chastity. In liturgy, white signifies purity, temperance and innocence. As a background for figures of saints it signifies chastity. The whiteness and value of the pearl has extended its use in symbolism. Oddly enough to us, white has been used in China as a symbol of mourning. This is a good example of the occasional difference in usage due to racial customs.

Black possesses a symbolism naturally opposed

to white. It signifies void, woe, gloom, darkness, dread, death, mourning, wickedness, chaos, crime, terror, horror, severity. We hear such expressions as black tidings, black looks, black outlook and black sheep. Jupiter, the terrible, was sculptured in black marble as opposed to Jupiter, the mild, in white marble. Pluto's chariot was supposed to have been drawn by black horses. Black was the garb of the Harpies and the Furies, the daughters of Night. Mors or Death is clad in black garments. Sleep, the brother of Death, and Night, the mother of all these figurative beings, are clad in black mantles. The power of black in poetry, in decoration, and in ceremonies is strikingly evident. It is one of the most important pigments and as darkness or shadow, it is a power in lighting effects. As a background it is an effective nothingness.

Gray possesses a symbolism partaking of both white and black. It signifies humility, penance, piety, maturity, old age, sobriety, sadness, matured judgment and even fear and death. In nature the skies on stormy days are gray and are expressed by the poet as sullen, dull, sad, and gloomy. Various monastic orders wear gray, black, and brown in various combinations. As a background for saints it signifies tribulation. Black and white combined have a symbolism quite like gray. Such combinations signify humility, melancholy, resolution, solemnity, secrecy and prudence. A black

and white habit has been worn by the Dominicans, the former signifying mortification and the latter purity. They represent the greatest contrast obtainable by means of pigments.

Fire, flames, light, and lamps possess an extensive symbolism which was largely established by religious creeds and their ceremonies. The sun as a source of heat and light and the blessings these bestow on mankind, is largely responsible for the divine significance of light and its associates. Darkness deservingly acquired complementary attributes for danger lurked behind its veil and it was a suitable abode of evil spirits. It harbored all that was the antithesis of goodness, happiness, security and plenty. Light became sacred, life-giving, and symbolic of divine presence. Fire was to primitive beings a most impressive phenomenon. The sun has been a deity to many primitive peoples as well as to higher civilizations such as the Egyptians, Assyrians, Babylonians, and the ancient Greeks. Worshipers of fire and of light generally considered these the purest representation of heavenly fire or light, the origin of all life.

Burning lamps or candles have long been associated with the dead and with various religious rites. The Romans, Phoenicians, and many Asiatic tribes buried lamps with the dead or burned them at the burial places. The Hindu festival in honor of the goddess of prosperity is attended by

many burning lamps. The Jewish synagogues have their eternal lamps. The devout Brahman maintains fire on the hearth and worships it as omniscient and divine. Lighted lamps symbolize holy places to the Mohammedans. The mythology of Greece marks the successful return of Prometheus with fire from heaven as the beginning of civilization. Greeks and Romans burned sacred lamps day and night in sanctuaries and before statues of gods and heroes.

Naturally the symbolism of light involved the lamp. Thus we see the torch, the oil lamp, the candle and the candelabrum symbolic of what light is. In pictorial representation it is difficult to use light symbolically without using the accessories. In actual lighting effects this difficulty is not so great. However, in most cases it is possible to use light more impressively than is customary. Acquaintances with the ceremonial uses of light will suggest many of the possibilities to anyone willing to devote some thought and analysis to the opportunities afforded.

The symbolisms and ceremonial uses of light and lamps are very numerous and they lead into many byways of creeds and customs. A more extensive discussion has been presented elsewhere ¹ for those who would like a further glimpse into

¹ Artificial Light — Its Influence on Civilization, 1920, M. Luckiesh.

primitive and ceremonial uses of light. Naturally after worshipping light for centuries, the lamps themselves became the objects of worship in many cases. Thus the symbolisms became modified and extended until light and lamps have played parts in many ordinary church services and more elaborately in many festivals such as baptisms, marriages, and funerals. The power of ecclesiasts aided a natural tendency toward symbolizing light. Christ became the "true light" and Christians are "children of light." Christians borrowed symbolism from pagans and have handed down to us many very impressive ceremonies in which lighted lamps, candles, or torches are powerful symbols. These symbolisms reach to the roots of civilization and are perhaps the most striking that we have. Their power emphasizes the superiority of primary light over secondary or reflected light. Artificial light has a powerful appeal which has not been adequately recognized, understood and utilized.

CHAPTER VI

ATTENTION-VALUE

BEFORE discussing this subject in detail let us have before us the principal characteristics of color as discussed in another chapter. All of these contribute toward attention-value. As stated heretofore these characteristics more or less overlap and often cannot be completely separated, nevertheless, they aid materially if one is bent upon analyzing or considering a specific case. The chief characteristics of colors which can be utilized in advertising and in merchandising are:

Vividness
Appropriateness
Attractiveness
Realism
Usefulness
Novelty
Distinctiveness
Innate Appeal
Symbolism
Incongruity

All studies of the psychology of color as pertaining to advertising and merchandising have for

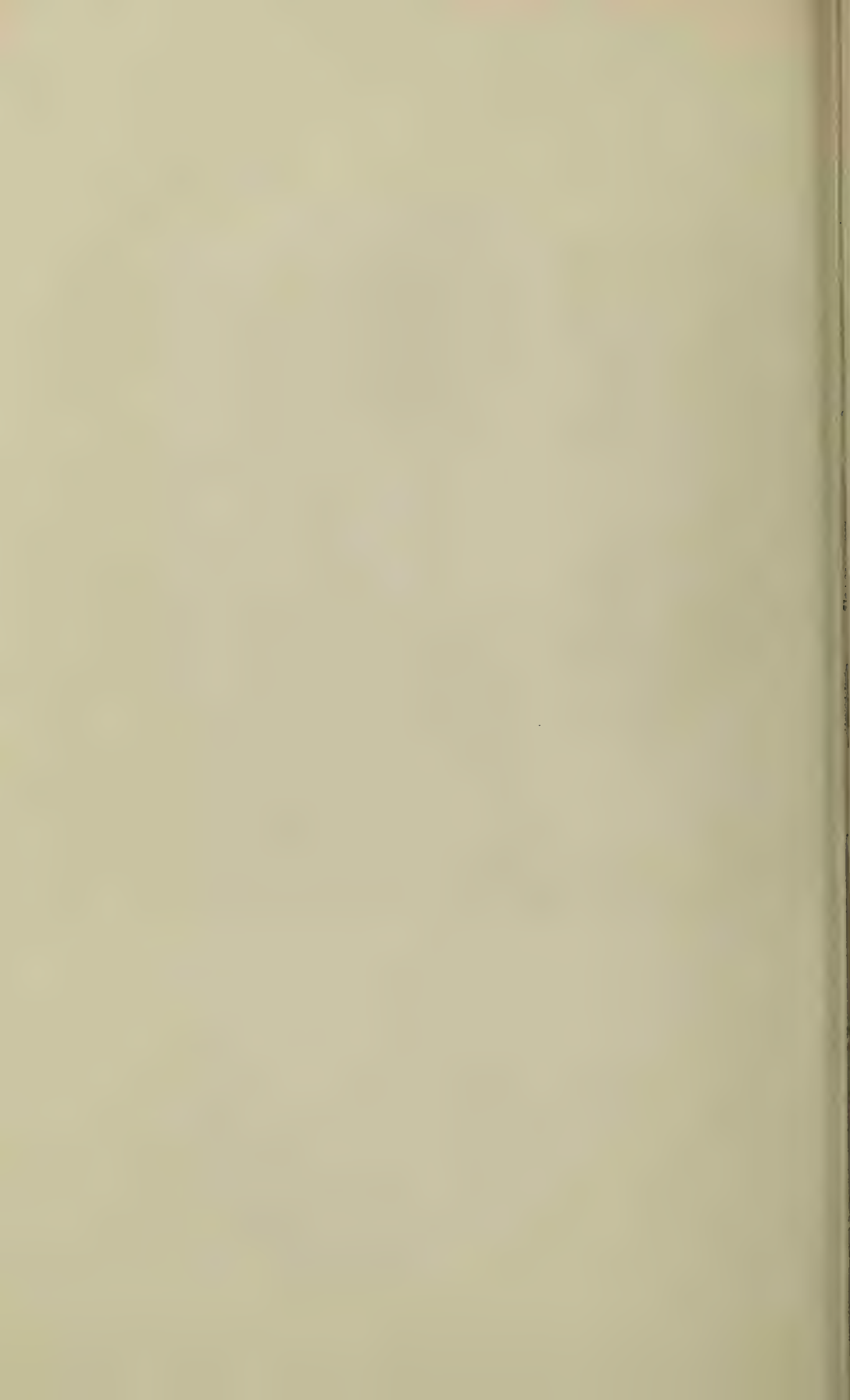


The Flight of the Hours - By A. A. Staff

(Courtesy of Underwood Typewriter Co.)

PLATE XI.

Delicacy of coloring is an appropriate garment for this delightful fancy.



one of their chief aims the revelation of the secrets of attention-value. Of course, all powers and characteristics of colors play a part in attracting and maintaining attention. Some of these have already been discussed. The physical characteristics of colors are perhaps the prime factors in attracting the attention initially and the physiological and particularly the psychological effects play a dominant part in holding the attention. Initial attention-value will be discussed first.

Without contrast everything, even life itself, would be monotonous. Contrast is the life of every activity and influence. It is the great factor in advertising whether it be verbal or visual contrast. Color contrast is a complication of brightness and hue contrasts. In analyzing a layout or a combination of colors, it is desirable to attempt to separate the hues of colors from the respective brightness of the colors. After some practise this may be done fairly satisfactorily. A layout of colors as seen by a color-blind person, whose vision is otherwise normal, will appear to be a group of grays limited in range by white and black. The gift of color-vision spreads over this layout a magical drapery of color whose effects upon the intellect are added to the original.

Striking brightness-contrasts are obtainable in black, white and grays, but upon these may be superposed those vivid, pulsating, seductive con-

trasts of color. Black on white is the strongest contrast obtainable by means of pigments alone, but it is an established fact that when color is introduced, contrasts of greater attention-value are obtained. When color is introduced the brightness-contrast is necessarily reduced because no color can be as bright as white or as dark as black, other conditions remaining constant. Hence, color-contrast up to a certain point is more effective than equal brightness-contrasts because the introduction of color produces more striking contrasts in certain cases than gray and white. In certain experiments on the legibility of various combinations of colors in advertisements for reading at a distance, black letters on a white background ranked sixth. Although this is discussed in another chapter it is well to note that attention-value depends partially on legibility and that the latter depends upon brightness and color-contrasts. Legibility and attention-value are not the same but they are intimately related in many cases. If an advertisement is not easily read it usually means that it is not powerful in obtaining attention. Under these conditions attention will not be held easily even though it is obtained initially. Of course, such factors as novelty, incongruity, and environment are influential upon attention-value. For example, a sign containing white or yellow letters on a green background is

not as conspicuous against a summer landscape in the country as it would be against a drab background of a city building.

In investigating initial attention-value it is necessary to use some method which gives the observer only a momentary glimpse of the test-objects. This tends to eliminate any judgments based upon artistic value or upon other criteria, because such judgments are not readily formed in the brief interval of exposure. The attention-value of a number of colors may be studied by placing similar patches of these colors upon a white background. Of course, other grounds may be used, but white is of special interest in advertising. By exposing the colors to momentary view and asking the observer to record those he saw, a measure is obtained of attention-value or something akin to it. The colors are re-arranged between each observation in order to eliminate any advantage as to position and to reduce the disturbing element of memory.

Using such a method Gale obtained the results presented in Table VI for a group of persons about equally divided as to sex. The percentage of noticeability is the ratio of the number of times a color was noticed to the total number of times all colors were noticed.

There was quite a difference in the results obtained for men and women which may indicate

an insufficient number of subjects and observations. The data are useful in illustrating at least that a measure of something of value may be obtained in this manner. It will be noted that the colors which ranked high are of very low brightness as compared with the white background; therefore the brightness-contrasts in these cases were very great. In the case of yellow the brightness-contrast was small and it was noticed

TABLE VI. — PERCENTAGE OF NOTICEABILITY.

Color	Men	Women	Both
Red	20	32	26
Black	34	12	23
Green	19	19	19
Orange	19	11	15
Blue	5	11	8
Purple	2	8	5
Yellow	1	7	4
	100	100	100

relatively few times. If the experiments were made with a black background instead of a white one, yellow would stand near or at the head of the list. It is also possible that blue and purple were mistaken for black. However, color-contrast very likely plays a part; in fact, this is suggested by the appreciable differences in the results obtained with the two sexes.

It is a matter of everyday experience that red always attracts attention quite markedly. The

universal use of red as a danger-signal appears to be a wholesale recognition or admission of its attention-value. In tabulating the colors of advertisements of various magazines, Starch found that 77 per cent. used red; 19 per cent. brown; 8 per cent. blue; 6 per cent. orange; 6 per cent. green; 6 per cent. yellow; and 5 per cent. purple.

Another method of studying the attention-value of a color compared with others is illustrated by means of data borrowed from Starch. A white card containing twenty-five words was exposed before a group of persons for a brief interval. Twenty words were printed in black and the remaining five in red were scattered among the others. Immediately after the exposure each person recorded the words retained in his memory. The data in Table VII were obtained from twenty-four observers.

TABLE VII. — ATTENTION-VALUE OF RED COMPARED WITH BLACK.

	Black	Red
Number of words exposed each time	20	5
Total number noticed by 24 persons	39	78
Average number of words noticed per person	1.6	3.2

It is seen that the novelty or contrast of the red words intermingled with the commonplace black words draws attention predominantly to the red ones. See Plate XII.

These experiments are presented not so much for the value of the data but to show that the

various problems of color in advertising and selling are subject to scientific investigation. The experiments show the reality of these various characteristics of color and the advertising specialist need not worry over the present lack of numerical data. If he knows that color has certain influences, observation and study directed by the general facts already known will lead him at least in the right direction in selecting the colors.

There are many little details which may affect the results. For example, in an advertising booklet the text was printed with black ink upon a yellow paper, but occasionally statements to be emphasized were printed in an orange ink. In the daytime the orange contrasted well and was conspicuous but under ordinary artificial light it was much "weaker." Artificial light is very yellowish compared with daylight and the orange ink and yellow paper did not differ much in brightness under this yellowish light. Furthermore, the color-contrast between them is materially less conspicuous under the artificial light than under daylight. The result was that at night the statements to be emphasized were rendered inconspicuous. This same error is sometimes seen on billboards and street-car cards which are to be read at night as well as during the day.

A knowledge of the physics of color will insure against any errors of this character. It might be

well to remember that a yellow on a white background may be entirely obliterated by a yellow light; a red by a red light, etc. The greatest brightness-contrast in these cases is obtained by illuminants complementary in color. Many years ago the writer developed a method based upon these principles whereby changing signs and even apparent motion could be obtained by the use of illuminants of various colors.¹

If one will recall his own experience or will observe anyone opening a pile of mail he will conclude that, other things being equal, colored envelopes usually receive more attention than white ones. The attention-value or pull of colored envelopes and letter paper was tested by J. H. Rothschild.² He chose 12,000 names from his company's mailing list and sent the same letter to everyone. He used a special letter-head in some cases embellished with two small cuts. He varied the color of the letter paper and of the envelope and recorded the results obtained from the different combinations. A house dress was described in the letter and each combination was sent to a different group of 1000 dealers. He complicated the matter somewhat by using the cuts in some cases and by describing a different dress to each

¹ Color and Its Applications, by M. Luckiesh, Chapter XII, D. Van Nostrand Company, New York, N. Y.

² Benjamin Berfield, Printer's Ink Monthly 4, May 1922, p. 64.

group. However, the results as presented in Table VIII show that there is greater attention-value in sales letters on colored paper and in colored envelopes than when white is used. No further conclusions as to color are safely drawn from a single experiment of this character, especially when complicated as it was to some extent.

TABLE VIII. — ATTENTION-VALUE OR PULL OF SALES LETTERS WITH WHITE AND COLORED PAPER WITH SPECIAL LETTER-HEAD.

Letter	Envelope	Pull
	<i>(Two small cuts)</i>	
White	White	18 per cent.
White	Blue	22 " "
Corn	Blue	26 " "
Green	Blue	28 " "
Gold	Blue	34 " "
Pink	Blue	48 " "
	<i>(Without cuts)</i>	
Corn	White	14 " "
Green	White	16 " "
Gold	White	21 " "
Pink	White	26 " "

The use of a colored envelope appears to be of advantage. The pulling power of the same letter without cuts on the company's regular letter-head with letter on white paper and with white envelopes was only 9 per cent. and with white paper and blue envelopes was 12 per cent.

Catalogues are a branch of advertising in which the element of doubt is reduced to a minimum.

F I R E

The Jekyll of and Hyde of Nature

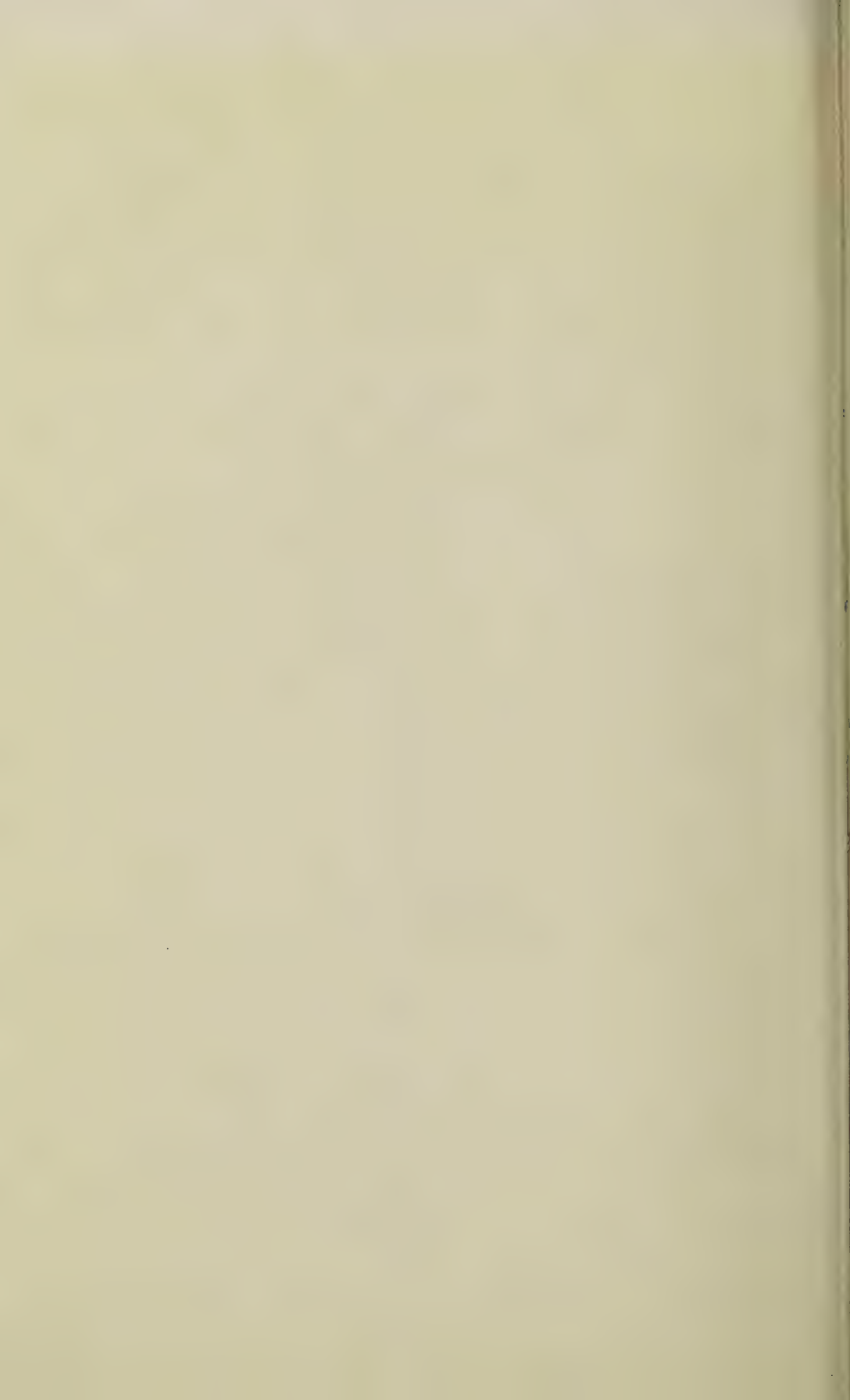
Fire has a dual personality—changing from a benefactor to a destroyer, without warning.



(Courtesy of Hartford Fire Insurance Co.)

PLATE XII

In this case red is very appropriate for it vividly suggests and powerfully emphasizes the evil nature of fire. It is so often the best second color that sometimes it is used where another color would serve better.



Some say it is possible to forecast sales results by calculations on the quality of various sections of the catalogues. The attention-value or at least the sales-value of color is so great that overstocked articles can be moved by replacing black and white pages by colored ones. After a catalogue has been issued a number of times and the returns are analyzed it is possible to forecast the result quite accurately. A certain seed company found its color pages to draw nine dollars in sales for one dollar drawn by the black and white pages. Even farmers who should know the kind of seed desired and who should be able to judge seed by various criteria, purchased far more of the products represented in color than of those in black and white. This was found also to be true of garden seed when the catalogue was sent to 10,000 bankers.

The attention-value of color is so intimately interwoven with other factors that it is difficult to rate it separately from an examination of the usual advertising results. For this reason material in other chapters is of interest from the standpoint of attention-value; however, a few results will be presented at this point in which this factor appears to have been prominent.

The circulation of a certain weekly magazine of humor stood still for many years during which its covers were printed in black and white. In

the meantime color was quite generally adopted for the covers of other magazines and this one in black and white appeared drab and lifeless amid its colorful competitors on the news-stands. Then a colored cover was adopted and its growth may be largely attributed to the introduction of color.

A large mail-order house analyzed the results obtained from two pages which advertised skirts. One of these pages was in realistic colors and the other in black and white. The prices of the skirts were practically the same and the goods were equally desirable. The sales of the skirts shown in colors were ten times greater than those shown in black and white. The mail-order company is in an ideal position to test the value of color and such cases as the foregoing afford conclusive evidence of the attention-value or at least of the selling power of color when used to depict merchandise in natural colors.

A certain company wished to quickly nationalize a product whose use was in cooking. They used a color to supply atmosphere and artistic effect, and to attract attention thereby. The desired result was achieved and this company has concluded that color is a good investment for them. It believes that women are not much impressed with black and white amid the colorful advertisements of present-day magazines.

A new fire extinguisher was introduced by a

twelve-page insert in four colors in two publications reaching automobile dealers, accessory stores, garages, and service stations. They testify to great results in the distribution of their product in two months. A four-page color-insert sold out the product of a fan manufacturer in double-quick time. These are among the many testimonials of the value of color for quick results. Color-inserts have filled the valleys in the sales records of many manufacturers.

A manufacturer of drugs put on a rapid-fire campaign using advertisements alternately in color and in black and white. Owing to the speed of the campaign no clear idea of the relative value of color and of black and white was obtained; however, it was found that the dealers talked only of the color-pages. In fact, it appeared that the black and white advertisements were generally overlooked. Owing to the speed of this campaign it is especially interesting as an experiment on the attention-value of color.

A stove company, by emphasizing in color the models it wished to sell, reduced its line from 700 to 212 models.

A manufacturer had a profitable model but a poor seller. By introducing color in the advertising of this model he made it a best seller.

The value of perfume certainly is confined chiefly to its odor. Of course, color through its

charm, attractiveness, and atmosphere can do much for any advertisement but a perfume manufacturer confined the color solely to the contents of the crystal glass bottle in his advertisements and this application proved miraculous as to sales. The use of color in this particular case was such that it was largely its attention-value which produced the great increase in sales. The color was green.

With the mounting costs of advertising and with the consequent relatively smaller space that some must be content with, the attention-compelling characteristic should be given the most serious consideration. Color in a smaller space often can achieve the results of black and white of greater area. As someone has said, color is the rainbow at the end of which the advertiser finds a pot of gold. Of course, there is always the question as to when the law of diminishing returns begins to operate. The answers to this question differ considerably. Some believe the continuous use of color increases its value rather than decreases it. Doubtless the correct answer depends upon the particular case. In any event an advertiser should be constantly checking and analyzing results.

There is no doubt that color inserts have been on the increase in the past few years. This may be due to the natural growth in the use of color,

or to the lavish display arising from a period of extreme prosperity. Even in farm papers color has been used to sell the farmer household improvements. Certainly the merchant who sees that a company is confident enough to use color is likely to look with favor upon the advertised product.

The use of color merely or chiefly to catch the attention is naturally a less scientific phase of the use of color than, for example, pure esthetics. In fact, in this field there is little accurate information upon which to base usage although the phases treated in various chapters should be used as a basis of judgment. Furthermore, all the trickery of optics, illusions, etc., should be understood by those responsible for such adaptations of color. Too many uses of color are either commonplace or exhibit a lack of deep understanding of the many byways underlying the effectiveness of color. It is almost a hopeless task to treat of the variety of possibilities. Weird backgrounds such as checkerboards or alternate stripes are permissible only when the specific case permits. Outdoor scenes with clouds tooled out of blue-sky backgrounds are often appropriate provided blue is not used to any appreciable extent otherwise. Other backgrounds of nature such as vegetation, seascapes, and desert have their possibilities. Colored borders, bands and arrows of color,

and the so-called bleed border are effective attention getters. Names of the products or selling points may be printed in color. In any case color should be used sparingly; usually it should be confined to the eye-catcher; and too much competition should be avoided. The use of color should be as free as possible from advertising mistakes and should be based upon a broad intimate knowledge of the many byways through which it appeals to mankind. In this way it can be made to pay the greatest dividends as the life of advertising and selling.

Primary light or lighting effects are also attention-compelling. The intensity of illumination, the lighting effect, the quality of light, colored light, etc., are effective in advertising and in merchandising. These factors are discussed in subsequent chapters.

CHAPTER VII

EFFECTIVENESS OF COLOR

REGARDLESS of our business or vocation, color has a greater influence than we realize. It not only affects us but everyone. In merchandising, color is bound to play a part some place along the line, regardless of the product. Sometimes color speaks more eloquently than the form of the package, the printed words or the product itself. It is important whether in the color-scheme for a factory, for an office, or for a product. In progressive companies color has a conspicuous place, although numberless errors are still being made in its use. The color-schemes and lighting for interiors are discussed in subsequent chapters. The present chapter deals particularly with color in advertising, although the general principles have other applications.

After having color available in lights and in pigments, what a drab world this would be if it were taken away. In advertising and in merchandising we should be grateful for it because it introduces so many possibilities. The black and white page can be enlivened with it, and its many

characteristics afford many opportunities to those willing to give the effort to achieve effectiveness not otherwise obtainable. Of course, inasmuch as it costs something to introduce color, it is well to ascertain the results of this additional cost before abandoning color to competitors. Many products are not particularly aided by a direct use of color in advertising but the great majority can be in some manner. Without special features to justify the use of color it seems reasonable that the power of an advertisement will be judged by comparison with its competitors in the same publication or vicinity.

After all, the use of color in advertising and merchandising must be justified by additional sales sufficient to warrant the increased cost. In magazine advertising the rate for two-color at the present time varies from about 20 percent to 75 percent greater than the rate for black and white, depending on the periodical. The rate of four-color advertising varies from about 40 percent to 120 percent greater than the rate for black and white. Some approximate relative rates per page are as follows:

	Black and White	Two-Color	Four-Color
Leading woman's monthlies	100	110-130	140-200
Leading weeklies	100	120-125	160
Quality monthlies	100	175	220
Some trade publications . . .	100	120-170	—



(Courtesy Hammervill Paper Co.)

PLATE XIII

The color of the paper can be effectively used as a part of the design.

This Paper is Hammervill Bond, Canary, Bond Finish

The foregoing gives an idea of the extra selling value which color must have in order to be justified. In general where the depiction of the product, its use, or its desirability can be aided by the use of color, the evidence seems to amply justify the additional expense. There are many testimonials to this effect but only a few representative ones need be presented in these chapters.

One company found that color pages whose cost was approximately twice that of black and white pages sold or pulled sales in the ratio of $4\frac{1}{2}$ to 1. In other words, dollar for dollar expended, the color page was over twice as effective in making sales. This is one of the more conservative statements on the subject. Other conclusions range as high as ten to one in favor of the color page against the page in black and white.

A group of advertisers were asked whether or not the use of color justified its additional cost. Eighty percent answered in the affirmative, five percent in the negative, and fifteen percent had no accurate information upon which to base a reply. Those answering in the affirmative considered the results from color were from 30 to 300 percent greater than from black and white. Most of them testified that color resulted in an increase in direct inquiries, in an increased demand upon dealers,

and that dealers preferred the colored advertisements. These replies have all the earmarks of general satisfaction as to the value of color.

The science of color advertising is far from perfection. Most advertisers who use color admit they are still experimenting, although they generally consider it to be a valuable sales aid. Some have voiced the opinion that it is most powerful and pulling in a catalogue when the number of color pages is limited. These advertisers naturally save the color pages for the articles to be specially emphasized. It is interesting in this respect to study the catalogues of the large mail-order companies. The largest of these had 120 color pages in a recent catalogue of about 1650 pages. This is about 7 percent. A cloak and suit company had 60 color pages out of a total of 402 or 14 percent.

Catalogue sellers commonly greatly increase the stock of articles which they have illustrated in color. Furthermore, they make a careful study of sales and of other factors to determine the candidates for color pages. Merchandise which has a strong color appeal includes seeds, clothing, ribbons, candies, paints, wall-papers, and floor-coverings. A large mail-order house recently devoted 24 color-pages to floor-coverings. A manufacturer of a certain type of floor-covering advertised the product nationally by colored advertisements. In effect he broadcasted minia-

ture samples showing the true colors and patterns. It was found that women went to dealers' stores with these color pages which they had cut from magazines. The use of color perhaps pays its greatest dividends in such cases where color in the product is of primary importance.

Mail-order houses are able to check up results of color-pages. They can list a certain dress in blue, tan, rose, green, gray, etc., printing the illustrations in black and white with the exception of one which is printed in color. The one represented in color will outsell the others. Mail-order houses selling suits have the same experience. Color does much toward accomplishing the same results as displaying an actual sample.

The seed companies were among the first to utilize color as an effective sales medium. Flowers, fruits and vegetables whose value depends so much upon color cannot be illustrated effectively otherwise. One large seed company recently used 24 pages in color, illustrating about 100 varieties of flowers and vegetables. It is confident of the value of color. Several years ago it brought out a new gladiolus illustrated in color and quickly sold out their entire stock of bulbs. The next year they gave this same product a full page in black and white with the result that sales greatly diminished. A company selling shirts to miners by mail eventually tried the plan of illus-

trating in natural colors. The result was that the sales increased enormously.

These are among the many testimonials of the value of color. Few persons have the ability to visualize things as they are when merely verbally described or depicted in black and white. Furthermore, difficulties are often avoided. For example, a fur company issued a catalogue in which the articles were described verbally and depicted in black and white. It is well known that it is difficult to describe colors accurately in words. Perhaps in this case the copy-writer possessed a large assortment of effective color-words and used them too prodigally. At any rate the black-and-white catalogue oversold the merchandise to the extent that many articles were returned. There was no complaint as to quality but much disappointment was expressed to the effect that the colors of the furs were not what were expected. Color aids the dealer as well as the consumer in visualizing and in ordering the merchandise. See Plates III and VIII.

A company selling fancy hat-bands for both men and women recognized that these products were bought only for their appearance. It also found that the best way to create a desire for them was by actually displaying them in windows. For these reasons it eventually decided to introduce color in the catalogue which was supplied to

the trade. On introducing color the company reduced the size of the catalogue without sacrificing effectiveness. The women's hat-bands, being used with other colors on the hats, make it necessary to consider harmony carefully. These combinations for the catalogue had to be selected with the utmost taste. In the case of men's hat-bands harmony was not so important.

The reasons for the use of color in connection with a few nationally advertised products may be of interest at this point. A certain company advertises a soap with a green wrapper and black stripe. It states that color is used to make the advertisement more attractive and to establish a distinctiveness by means of which the product is recognized.

A phonograph company states that it uses color chiefly because it goes with position, its advertisements being chiefly on the back cover of magazines whose covers are printed in color. The mahogany cases of the instruments are well shown in black and red, but as a general rule this company does not deem color indispensable. However it does appear that color in this case can help the observer to visualize some of the intangible phases of music.

A leading manufacturer of silverware states that silver can be depicted best in black and white but that color is used for atmosphere and for at-

tracting the eye. Color could be dispensed with but it is believed that its results justify its use.

When and how to use the second color in advertising depends upon the product, its use, the manner of its appeal and other factors of the specific case. If it is decided that color can be helpful in some manner, by all means use the second color, but also use second thought and, if possible, second sight along with it. There are numerous examples of its usefulness.

A tire manufacturer employed the second color to emphasize the product. The dealers admitted that the color made additional sales.

A manufacturer of belting employed color for realism and to attract the eye to the belt in the illustration. In this case color not only focused attention upon the right point but also gave one the "feeling" that the product was made of good strong leather.

We are familiar with the yellow-orange second color used by a large oil company in its advertising. The color is attractive and popular and also is a fair representation of the product.

A nationally known maker of a beverage which was given nation-wide publicity by a remark from one of our statesmen who arrayed himself against intoxicating beverages, uses reddish purple for realism and also to make the "mouth water" for the drink. This second color is not as striking

as brighter and warmer colors but it had to be used because the beverage was of that color. By illustrating the beverage about to be drunk and with an expression of anticipated pleasure on the countenance of the drinker, the color was effective.

A packing company used color as an appetizer by depicting a dish heaped with dill pickles, life-size and perfectly reproduced as to color.

A manufacturer of rubber goods has displayed a blue-print reproduced with fidelity along with a black and white illustration of a rubber belt in use. The blue-print suggested the engineering aspect of the application and added the quality which naturally arose from an impression of a job consummated upon a basis of technical knowledge.

We are familiar with the advertising of a certain fruit which implies that wonderful properties have been acquired by the fruit through the simple medium of osculation by the affectionate orb of day. Certainly orange as the second color is compelling and appropriate. Its warmth even suggests the glory of California sunshine and all its good properties in yielding luscious fruit.

Ofttimes decorative borders in color and ornamental colored initial letters in the text are used effectively, particularly where the impression of quality is desired.

Color is effective as a spot of color confined

entirely to the product. For example, a vase or a portable lamp can be done in a second color superposed over the black which is done in various grays. In this manner a very effective result is obtained in color of various shades and tints. This concentration of color is very effective.

Sometimes the first letter of each word in the title of an advertisement is done in the second color, the remainder being black. This difference in brightness contrast is annoying and the value of this usage is questionable. In any event the second color used in this way should be very dark in order to approach the black of the remaining letters so that both the color and the black are approximately of equal brightness contrast against the background. This usage of color requires careful consideration.

Colored backgrounds are often used to suggest quality and sometimes because there is no other satisfactory place to use color.

Many manufacturers or packers of food products welcome color as a vehicle of expression. We are all familiar with the garden luncheon scenes done in color by a large packing company. Here we have not only the product rendered "good to eat" but we have setting and its subtle influence.

A camera company uses photographs rendered in black and white with soft tints superposed.



(Courtesy of Hammermill Paper Co.)

PLATE XIV

When the shadows are deep one color can be very effective on a paper of different color.

This Paper is Hammermill Announcement, Sepia Antique

The use of color here is to impress upon the observer the charm of photography and even to suggest more than ordinary photography accomplishes. The photograph is made as appealing as possible and delicate color is of great help.

Various kinds of roof materials have been put over to the public by the use of color. The charm of some of the slates and tiles could not be revealed to the reader in black and white. See Plate XVI.

A certain oil is nationally advertised as having many uses about the house and elsewhere for lubrication, preventing rust, etc. The manufacturer believes that color gives strength and striking force to the advertisement. The color is also used to give distinctiveness to the trade-mark but otherwise it is used in an accessory way.

A piano company considers color the finishing touch of art in an advertisement. Sales greatly increased after color was introduced into the advertisements by this company. The cost increased from a quarter to a third and more than compensates for the difference. This company uses color in various other ways including mailing cards, lantern slides, and envelope stuffers. Another piano company uses paintings that are works of art. In these the piano is not at all prominent but the impression is one of high quality. A company manufacturing pipe-organs also uses repro-

ductions of beautiful paintings in which setting plays a prominent part. In fact one has a strong impression of the blending of the instrument with the interior decoration and furnishing. These are instances of the value of harmonious and beautiful pictures for displaying articles in proper settings and for suggesting the highest quality.

One of the most effective but simple uses of color is in connection with a rouge. Eleven boxes are lined up in perspective with their lids off so that the rouge is visible. The actual eleven rouge tints offered in this product are shown by printing the various shades of pink. The rouge showing in the first box is a deep pink and the color lightens until in the eleventh box it is a very delicate tint. These various boxes are numbered so that color here is very useful as well as of attention-value. The more faithfully merchandise can be depicted in its correct color and texture the easier is it to sell through printed advertising. Natural colors help to bring the articles conspicuously before the eye. The art of display is founded upon this principle and in advertising the aim should be in many cases to approach an actual display as nearly as possible.

A simple and extensive use of a combination of attention-value and symbolism is the case of red in connection with fire hazard. A notable example of such use is a national campaign by a fire

insurance company. The advertisements are in black and white with a simple use of red as a second color. The red compels attention and symbolizes fire. Symbolism is further taken advantage of by representing fire hazard not only in red but by placing the color on various figures. Thus in the different advertisements are found a red wolf symbolizing fire as an outlaw. In others there is a red devil and in another a grasping hand in red. In some of the advertisements flames or the word, fire, are in red. Each advertisement is a graphic emphasis of the menace of fire. The color, figure, and wording symbolize fire as an outlaw, a vampire, a night rider, or a Jekyll-and-Hyde of Nature. The idea in each case is simple and extremely effective but without the second color — red — the effectiveness would be greatly diminished. These advertisements show the value of using one dominant idea which is easier to grasp than something more complicated. The meaning of the advertisements is quickly and vividly comprehended. They also represent an improved standard of taste. See Plate XII.

Color should not be used just because the company can afford it or to make the advertising matter better than the article described. Certainly color should have utility, it should add realism, or should make the advertisement suffi-

ciently more attractive and suggestive to justify its additional cost.

A company wished to introduce its machine tools in educational institutions and planned for circulation among the schools, a booklet which would be sales-promotion literature showing the quality and desirability of the goods. The booklet was also to be used as an introduction book for the students. The conditions were such that black and white could hardly do the work required. A two-color booklet was devised which was very successful.

A manufacturer of floor-covering found that color could make a booklet look like a sample of his material. By using black and white he would have saved two thousand dollars in the cost of 500,000 booklets done in two colors but he would have lost the great value of closely imitating the product. The use of color was thoroughly justified.

Ofttimes when the use of color is considered purely from a decorative standpoint, the question arises as to the increased value of the advertising in proportion to the increased cost. Even in the case of decorative purposes, suitability or appropriateness must be considered. It is possible to make things attractive even in black and white but having color-printing and colored lights shall we ignore them? It is just as natural to introduce

color in printing and color in lighting effect when striving for attractiveness as it is to grasp any desirable tool which is available in any other work. The best answer is that many of these queries are settled by using color in some manner even though it may be merely for the setting. Just as silence helps to make music so does the setting help to make an advertisement. Color is one of our tools and, as the end must justify the means, the end must justify our employment or omission of color in merchandising.

Color in backgrounds can be used in such a manner as to "snap out" the article advertised. Sometimes the colored background should be limited to a small area in order that the eye will be attracted to the desired point. Naturally circles and other simple figures are used in these cases to confine the color. Red, orange, and medium green backgrounds are effective because they are not only colorful but provide good contrast. Pale blues and other delicate colors are less forceful but are excellent for large areas when emphasis or attention is desired on the superposed copy. Sometimes striking banded or checker-board effects are used as backgrounds for their attention-value. In such cases it is particularly desirable to give close consideration to the visual problems or the ability to distinguish and to read the copy.

Color has a simple field outside that which is usually represented by the poster and the decorative illustration. This simple field has been called typographic color for herein color is used in connection with type pages and the general plan of booklets and circulars. This is not the field where red emblems, such as red devils, red arrows, red spots, red bands, etc., are used as conventional marks for a product. It is not the field where color is used for realism. Typographic color is used to give style, dignity, and quality to the printing. The problem is one of esthetics and by solving it we achieve the expression of quality. Here color must be used sparingly or finely. It must be of delicate tints, of subdued shades, of deeper subtleness, of greater richness. Instead of blatant red we should consider such colors as sienna, umber, olive, brown, and others. If red is used it may be muffled by reducing its area, by using fine lines, by exquisitely intricate designs, etc. It may be tempered by being applied as lace-work rather than by being permitted to flow freely from the tube without restriction. Some of the de luxe editions and also some books of the Church are fine examples of this use of color.

In such a field of printing the color should be deep in hue or solid in order that there will be a contrast comparable with black and white. Headings, portions of text, initial letters, etc.,

must be read and therefore must be in deep solid color. For this purpose vermilion, brown, olive green, and deep blue are satisfactory. If the type is to be in black and the second color applied only to borders, backgrounds, etc., many colors are possibilities. Certainly in either case the color should be conspicuous enough to be easily discernible. Why have the color so delicate that it can be distinguished from the background with difficulty or so dark as to be not strikingly different than the black ink. Here also it is well to view the proofs in ordinary artificial light as well as in daylight in order to see how the color lives under the yellowish artificial light.

In this kind of use of the second color simplicity seems to be quite important. If the type is black a large decorative initial letter in color is sufficient. Perhaps a fine-lined border or other ornament may be desired. However it is well to choose but one of these rather than to have all of them vying with the printed matter for attention. Many decorative effects are possible in a variety of colors; for example, vignettes, wood-cut effects, foliated borders, etc. These are generally better applications of the second color in "quality" printing than the use of color for backgrounds.

A street-car card offers problems peculiarly its own. It is of small size, often on a curved sur-

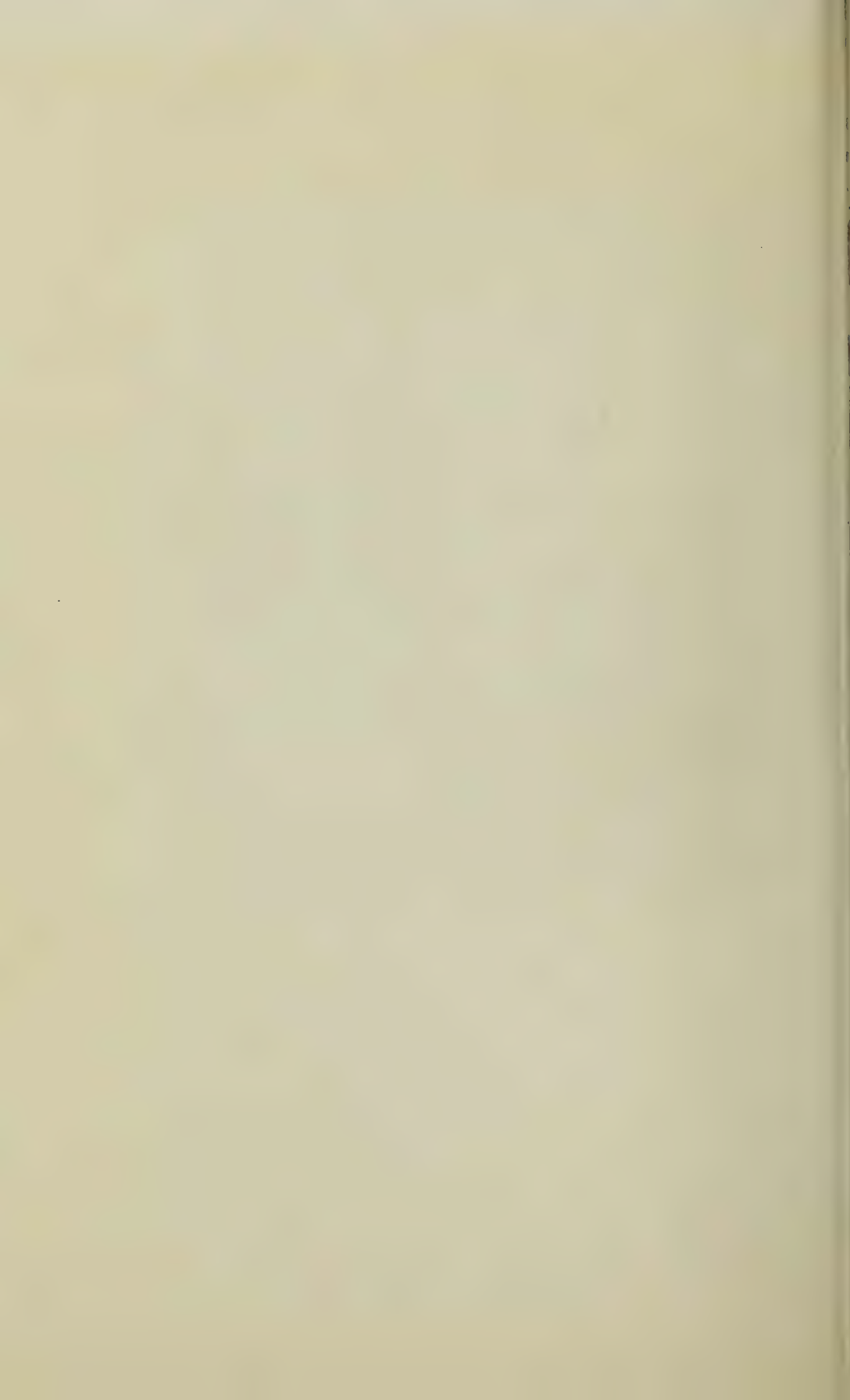
face, and not uncommonly poorly illuminated. The art-work must have the strength to carry from ten to twenty feet. This means striking contrasts in brightness or in color. Of course, artistic considerations require a certain delicacy and subduedness which may have to be sacrificed in order to obtain carrying power and attention-value amid much competition. Such contrasts as orange and yellow with black or blue are striking. Black text can be printed on light tints. There was a time when such cards were printed largely in black and white but now color is prominent and much fine art work is devoted to this field. When contemplating a street-car card it seems wise to study the cards in actual use in order to be able to make a choice of color and design which would be conspicuous among the other cards. Such a card is likely to be better fitted to make itself felt than one devised without its contemporaries in mind. In choosing the colors for cards it should be noted that these are to be seen a great deal under artificial light which favors the yellows, oranges, and reds at the expense of the violets, blues, greens and many purples. Not only colors but contrasts will change greatly under artificial light. It is best to study the choice under artificial light as well as daylight before the final decision is reached.



(Courtesy of Fiberloid Corporation)

PLATE XV

Besides depicting things as they are, harmonious colors suggest quality in a distinctive product.



These are just a few representative examples among many. They are presented to aid the reader in visualizing a specific case. We are all familiar with many products, trade-marks, and packages which have become stamped upon our memory largely through the use of color.

CHAPTER VIII

SELECTING COLORS

THE selection of the second color or of combinations of colors depends upon the specific case and therefore can be discussed only in a general way or by means of certain specific cases. Many of the latter have been presented in preceding chapters. Before discussing the subject it appears desirable to summarize the chief accomplishments of color in advertising and merchandising. The following brief statements indicate these accomplishments as compared with black and white.

- Color compels attention
- Color adds novelty
- Color is more vivid
- Color is symbolic
- Color is more attractive
- Color lends distinctiveness
- Color aids in achieving realism
- Color possesses innate appeal
- Color depicts product, package or trademark
- Color shows usefulness of many products
- Color suggests quality through subtle atmosphere

Color keeps advertisements longer from the waste basket
Color can feature a change in package
Color suggests seasonableness
Color is to vision as music is to hearing
Color can be used so as to attract better class of replies

There are many opportunities to utilize established symbolisms in selecting a color or a combination of colors for a package, for a trade-mark, or for a color to be associated always with an advertisement. These cases and many others afford opportunities for utilizing also a broad knowledge of the expressiveness of color. Oft-times the company contemplating the adoption of a trade-mark, a package or any other trade insignia, would be justified in spending hundreds and even thousands of dollars in obtaining expert criticisms and suggestions. An example may emphasize this point.

Three very large companies selling a product whose gross sales exceed sixty million dollars a year, are affiliated in a certain manner so that they coöperate in developments, in advertising campaigns, and agree upon certain generalities of commercialization. The product is sold in a certain standard package which is mechanically alike in the three cases. The exteriors of the three packages, however, differ as to color, and advertising material, and of course, the name of the company. One package contains a clever slogan

and line drawing, the value of which disappears when viewed at long range. The dominating color is rather dark brown and yellow and is scarcely observed as a color. The second package contains printed matter in large type but of very unesthetic and "shortrange" colors which are really rather disagreeable dark shades of impure green and orange. The third package contains printed matter in large type but is distinct in a single light-blue color with letters in white. The three packages display on their covers conventionalized representations of the product. The third package lives as far as it can be seen by virtue of its single blue color and this color is one of the most pleasing. It is sufficiently pure to be striking but is still bright by virtue of its being a deep tint. Here purity was somewhat sacrificed in order to obtain brightness, a requisite for "carrying power." When these three packages are viewed at a distance the first two are inconspicuous and lacking in anything which distinguishes them from many other ordinary bundles. The third, however, is recognized at distances several times further than the first two. The third is also lacking in garishness with the result that shelves neatly filled with its kind are exceedingly attractive. This is not true of the other two. Hundreds of thousands of dollars have been spent in advertising these packages but the first two have been handicapped

from the beginning by the lack of judgment in the selection of the coloring and general make-up of the copy on it. These packages have been competing for many years and it would not be very difficult to make a rough estimate of the cost of the handicaps of the first two. Is it not possible that \$100,000 would be spent gladly if the years could be turned backward for a moment while the handicaps of the first two packages could be removed? Will the time ever come when a most thorough consideration will be given to such an important matter at the momentous occasion of its birth?

A careful selection of color is advisable in any case. A "sport" model of an automobile is expected to be less conservative than a regular model; however, it is not wise to overdue "sportiness." A "fire wagon" red will always attract certain unsensitive individuals with the taste of a savage but will not attract many who would like something with a little more "class" than the conservative regular models. Still there are cases of standardized colors too "loud" to attract the number of buyers that would be otherwise attracted to the "sport" car with its better equipment. This is an example of an error not uncommon.

Too often the choice of color has been left to incompetent persons, or worse, to one person not

particularly qualified. Most of the problems of color in merchandising are of sufficient importance to be put before experts. Of course many of the errors are quite obvious after they are pointed out. For example, certain rubber goods whose color is red were packed in red boxes. Not only were the boxes red outside but also inside. When the articles were displayed in their boxes from which the lids were removed they did not stand out clearly. If the shallow containers had been lined with white or gray not only the color but also the form of the article would be clearly defined.

A candy manufacturer decided to use a delicate color for a new package feeling that color had the desired charm. He concluded that pink was appropriate so he lined the box inside and out with pink and even inserted the word, pink, in the name of the package. After marketing these for some time he investigated and found that against the pink background the candies suffered in appearance. The delicate tints of the candies were overwhelmed by the strength of the pink and the chocolates by contrast appeared grayish or even greenish gray. The color scheme was revised. All that was necessary was to subdue the color so that the candies were enriched in appearance.

A manufacturer of a cosmetic selected a beauti-

ful scarlet for the color of the package or container but for just what reason is not known. Doubtless it was selected because it would be striking and effective. It happens to be true that red is the color most preferred by women for color's sake alone but of course there are other considerations. After some time this manufacturer received a letter from a woman asking why he should select red for a container which was to sit on a woman's dressing table. She pointed out that she had never seen a red motif for a dressing table and that most of them are of delicate or less obtrusive tints and shades. Of course, the scarlet box was hideous amid her delicate azure color scheme and it is not surprising that she turned to another cosmetic whose container was of such a color as to be less obtrusive and inharmonious. She even suggested that the manufacturer supply containers of a choice of colors likely to be suitable to the dressing table. This is a good example of the complexity of the subject. Not only should the color be suitable to the product and pleasing in itself, but ofttimes it should be adapted to the environment where it is to be used.

A chain grocery store was located three doors from an old established grocery which had been doing a very large business, but the latter continued to do a good business while the chain store was unprofitable. In due time an inquiry was

made on the ground by a committee from the chain company and it was decided that the dull green and maroon front of the chain store was less attractive and pulling than the warm cheerful yellow shade and buff trimmings of the successful store. This conclusion led to a thorough reconsideration of the color scheme for the chain stores.

Some chain stores have utilized color effectively by choosing colors appropriate to the products sold or by using colors purely for their attention-value. The questions involved are numerous and interrelated. For example, a chain of cigar stores uses brilliant red and the stores are located at the most strategic places. Here color is used for its attention-value and becomes a distinctive mark. These stores aim for the patronage of the rank-and-file users of tobacco, and make no claim to exclusiveness. Red suits their needs excellently. The more artistic lettering and the harmony of gold and brown with shades of green and yellow mark another tobacco store as more generally exclusive.

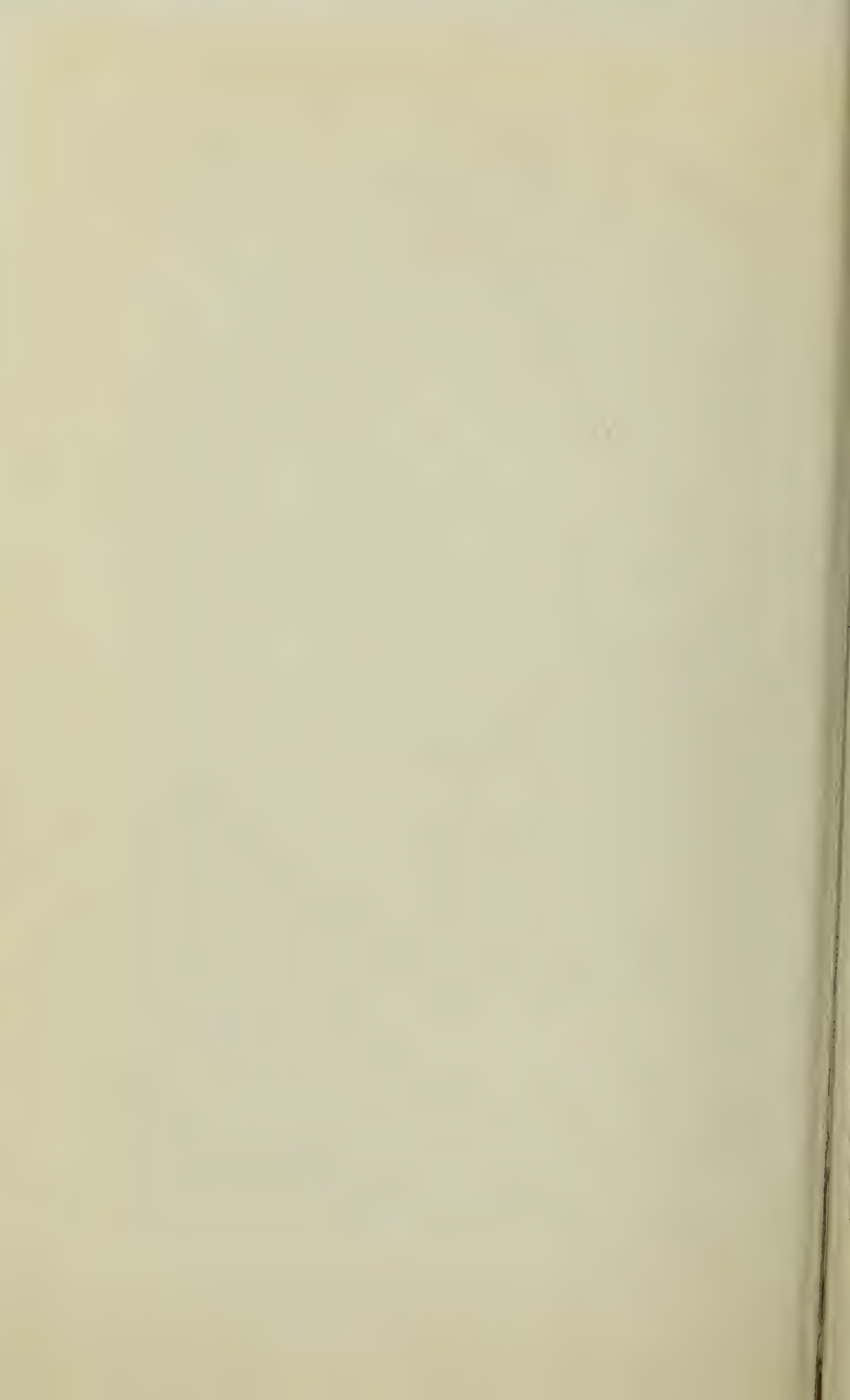
A large manufacturer wished to open a chain of hardware stores throughout the country and it was the desire by some means to distinguish these stores from other hardware stores. Color was chosen to do this. Gray was selected for the store-fronts and window-backgrounds. The name



(Courtesy of Johns-Manville Inc.)

PLATE XVI

In this advertisement the appeal is not only achieved by color in the advertised product (asbestos Colorblende shingles) but largely by color-harmony of the roof and its environment.



of the owner of the store was to be in red and the trademark which is a single word was to be done in characteristic style in gold upon a blue background. This is a harmonious color scheme as used and the combination is effective. It must be reproduced as nearly the same as possible in each case in order to be of the greatest value to the chain stores. It is well in such cases to paint samples in quantity at the beginning in order to be able to send the exact colors to distant points when new stores are located. This is better than to depend on names of pigments and paint formulae because the latter vary considerably owing to the lack of standard pigments. Many troubles arise in the use of color on labels, packages, etc., because of carelessness in reproduction or of lack of standardization.

When color was introduced into advertising copy it opened up possibilities and with them came many new problems. Assuming that the advertising specialist had solved all the problems in black and white (which of course he had not) and had mastered the optics, had conquered balance, and had grasped the great potentiality of illusions and eye movements, or in fact, had attained a thorough understanding of the psychology of visual appeal, he was now confronted with a new series of opportunities and problems. For example, a title which heretofore was printed

in black and white was now to be attempted in color. Should the type be as large as in the other case? Would the balance be maintained if the color, which was brighter than black, were used? Would a title in vivid color weaken the color appeal of the illustration? All these questions also arise in the case of color in the border and elsewhere. Furthermore there arises the question, "How far to go with color?" Having committed himself to the extra cost of color it is not easy to use it sufficiently sparingly. On introducing color there arises a great many questions of harmony and attractiveness.

One of the greatest drawbacks which is first encountered is the scarcity of good color artists that have been trained to think in terms of advertising. A commercial artist who has made good in black and white is not necessarily certain of success in the use of color. Obtaining proper values and contrasts in black and white is perhaps more difficult than when color is used. That is, color confuses the issue and commands a certain degree of attention so that values are likely to go by the board to some extent. The skilled artist in black and white is likely to be too delicate in the use of color and therefore may find his colors weak. The ideal commercial artist is one who is a master of color as well as black and white. But in using color one must think in terms of color with black

and white as ballast, not too forward in his thoughts and still not out of them entirely.

Ofttimes difficulties arise in obtaining printing inks of the colors which the artist has provided but this is a matter which need not be discussed here. A skilled color-printer can do the work required if necessary. Of course, there are certain effects arising from the peculiar surface effects of the artist's color which are not commonly recognized as such. Certainly the printer cannot be expected to produce the same appearance with another surface. The artist should recognize the printer's handicap and should attempt to analyze the scientific reasons for the appearance of his coloring media.

A common error is to have a book cover in colors quite out of harmony with the inside matter. The shock or disappointment which arises on opening the book is likely to react unfavorably. An exquisite cover may oversell the contents and by contrast cheapen them. If one follows the always safe rule — simplicity — it is not difficult, without undue expense, to make the contents in harmony with the cover. The more elaborate the cover is in design and in color, the greater is the likelihood of its overselling and overshadowing the contents.

There are many things that one learns not to do or that are not worth the effort. It is possible

to print an unbroken surface of solid color of a deep shade or hue and to accept the result with a blind eye toward blemishes, but is it worth while when paper of the desired color is available? This criticism does not apply to the printing of backgrounds in light tints. It does not seem worth while to attempt to print a white on dark backgrounds excepting in very special cases. Many other similar difficulties can be overcome, but usually there is a better way out than through printing.

Gold, bronze, and silver on covers often appear so different in surface texture from the body of the paper as to be unsatisfactory. Their smooth metallic surfaces are either dull or bright depending upon their position with respect to the light-source. A rougher surface is desirable and sometimes this can be achieved by submitting these metallic surfaces to a process of roughening. The recent developments in printing, with more papers, two-tone inks, and the many processes, make it possible to supply all reasonable needs and to reproduce natural colors with marvelous fidelity. These numberless possibilities should supply advertising needs until the more lagging factors, such as color design, catch up with the procession.

It is impracticable at this point to attempt to go into detail in regard to the advantages and disadvantages of various colors. Preceding chapters

have aimed to bring out the many characteristics of color as found by explorations of the many byways. However, some brief discussions are incorporated at this point which may be helpful.

From a study of the use of color in advertising and in other paraphernalia of merchandising, it appears that "when in doubt, use red" seems to be the motto. There is no doubt as to the many good qualities of red but it also has its defects. For some purposes it is of ill repute. Sometimes its very forcefulness or obtrusiveness makes it difficult to live with. It may become less and less desirable. It may appear undignified, too cheap, or too gaudy. Nevertheless it is far more used than any other color. Of course as a second color it can reproduce the flesh tints quite well and at the same time appear in full color in other portions of the advertisement. When superposed upon black it gives reddish browns. Its tints and shades have a wide range of usefulness but nevertheless it is used much more than necessary. Red is properly used as the second color in Plate XX.

Admittedly it has power but why use it when unnecessary. Hundreds of companies are using it in an abstract or conventional manner. Certainly many of these could use some other color and thereby get out of the ranks of the commonplace. Where its symbolism, emotional value or

other characteristic can be directly utilized it is wise to use it. Why should a maker of a rubber boot place a red circle on each boot? Why not a brilliant yellow? This would be even more conspicuous on the dark rubber than the red spot. Why should a manufacturer of metal fence-posts tip each post with red when orange or yellow-green might answer the purpose? Why should a lighting device have a red spot instead of a yellow or orange spot? Why should a shovel have a red edge instead of a light green or yellow?

The extensive use of red doubtless arises from its well known power and versatility, but through thoughtlessness the usage has become contagious until we have an extravagant usage not wholly justified when examined closely. The value of color depends among other things upon its novelty. Red marks the rear of millions of automobiles in this country. It is becoming more prevalent in signals on our streets. It is seen in electric signs and billboards. It has become very common. If it has powers which can be particularly utilized in any specific case of advertising and selling it should be used. If it has been chosen merely as a mark perhaps a mistake has been made. There are other colors which under many circumstances offer more contrast, more distinction, and greater novelty. It is senseless to choose what is most used merely for that very

reason. It is also senseless to think that the eye and the mind do not tire of red as some superficial writers have declared. Red is powerful; it is versatile; it has many specific uses; but it is not universal.

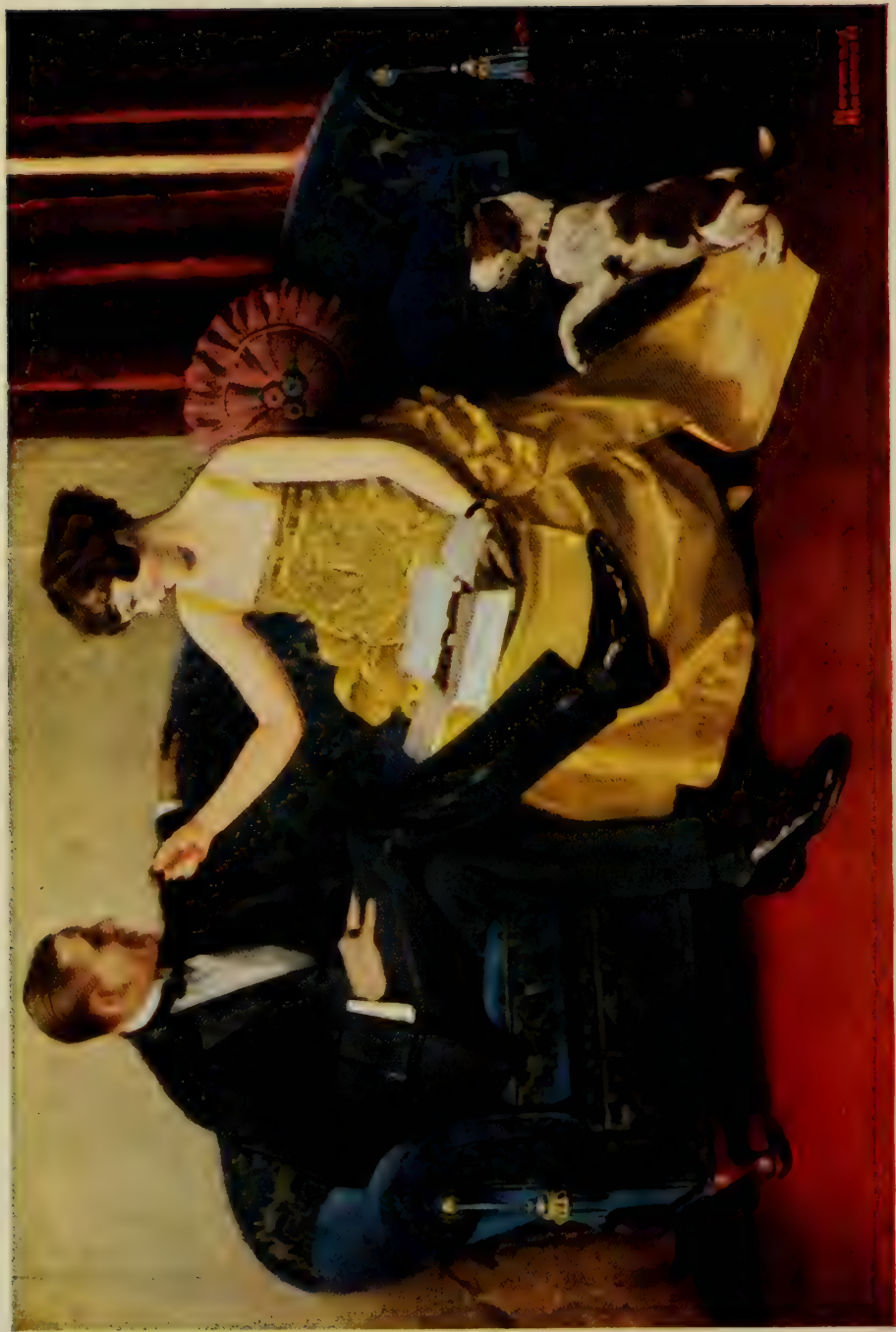
Red may be the most striking color but oft-times it does not wear as well as some other colors such as green and blue. A dominating color of an advertisement which, for example, is to mark the doorways which lead to counters where the product may be obtained, must continue to be appealing and be best suited for its environment. There are cases where the appropriateness of red may outweigh all other considerations. As a color for a fire extinguisher advertisement it would usually be just right and the very best.

Red signs sometimes help make a street garish and hideous and when seen against red brick buildings are not as effective as a more contrasting color under the circumstances. If the same advertisement or slogan is to be transferred to calendars, red will not generally be acceptable as a color to hang against the wall. How many calendars reaching well-appointed offices and stores are relegated to the waste-basket or to the shipping-room because their colors jarred? And again, how many beautiful calendars of competing products are allowed to live because their beauty protects them from premature cremation?

In such cases art pays as well as on the cover pages of the best magazines.

The average person who has something to do with advertising and merchandising but who is not an expert, if asked what should be used for the second color would likely suggest red. Red and black are most commonly used. Red is powerful and has many appropriate uses but as already pointed out it is also misused and over-used. It brightens under ordinary artificial light.

Orange and black are often a satisfactory combination and perhaps rank second to red and black in usage. Orange is striking, warm, pleasing, bright and powerful. Its shades are not particularly pleasing except when deep enough to be brown. It appears safe to state that red and orange are used in advertising more than all other colors. There can be no objection to these colors when they best serve the purpose but it should be remembered that there are many others on the painter's and printer's palettes. From black and one other color quite a variety of effects can be obtained. The second color of various depths laid upon grays sometimes approaches the full-color effect. Black of course gives a variety of grays depending upon the depth of pigment. Red and orange on dark gray or nearly black give brownish color. Black is usually the best key-plate for a color job.



(Courtesy of Cox Confectionery Co.)

PLATE XVII

Color aids materially this pictorial suggestion of an appropriate place for a box of chocolates.

Yellow covers a variety of hues from greenish yellow to deep yellow verging upon orange. Its hue and tint are very important for it can be pale, sickly and listless. On the other hand it can be brilliant, bright, warm and inviting. Care should be used in selecting the tint and hue. Shades of greenish yellow are often very displeasing. Yellow upon grays lends a greenish hue. Buff which is a shade of yellow or orange is a very pleasing subdued color. Yellow suffers some under ordinary artificial light by being reduced in contrast with white backgrounds.

Green has many pleasing attributes but can be very cold, sedate, and cheerless. The fresher hues of spring are enlivening. The shades are dignified. There are many valid reasons for the use of green but it can not add warmth and brilliancy to a color scheme. It wears very well on the observer.

Blue is one of the most preferred colors. It can be cold, dignified and even depressing but it is a wonderful color for harmonizing other elements. Some of its tints may be described as being effeminate. Its shades are very dark and have short range. It suffers a loss of brilliance and even of hue under ordinary artificial light. It is usually safer to use a medium tint of blue in order to insure life, brilliancy, and carrying power. It is the most preferred by men for color's sake alone.

Full purple has a few striking uses but in general is somewhat disappointing. However, it should be remembered that there is a great variety of purples between violet and red such as bluish purple to reddish purple. Its tints are the most beautiful of any group of colors, for they include pink, magenta, rose, mauve, lavender, and their allies. Shades of purple approach black too closely to be of much value as dominating colors. Purples change considerably under ordinary artificial light, becoming reddish and sometimes appearing quite like red or its tints.

It would be an endless task to go into the harmony and practice of color. Such discussions have been presented elsewhere. The color-printers have experts who can answer questions as to the technique and to the results of superposing various colors. It is sufficient here to show the importance of certain aspects and to indicate the extent of possibilities. The physical tools for color in advertising and in merchandising are hues, tints, and shades. Purple does not exist in the spectrum but it is just as much a primary hue from the viewpoint of distinctiveness as the spectral hues. Therefore, adding the various "pure" purples, from violet-purple to red-purple, to the spectral hues, we have a large number of pigment hues available. These may be modified by the addition of white to form a vast number of tints.

They may be mixed with various amounts of black to form a vast number of shades. The tints may also be modified by the admixture of black. The final number of colors available in pigments then totals at least one hundred thousand. These are the physical tools of the advertising specialist which may be used. Of course, the range of gradations of hues, tints, and shades is limited by the refinement of the processes of color-printing. There are scarcely any limitations in lighting. The psychological effects of these colors and their combinations are manifold. The expressiveness and impressiveness of colors are realities. The sources of information pertaining to the effects of colors upon mankind are numerous.

The available information pertaining to the psychology of color is already voluminous and a broad knowledge in this direction will aid the advertising specialist and merchandiser in utilizing some of the potential powers of color in attracting and in holding the attention of consumers. Much remains to be done before the application of light and color in these fields is reduced to simpler rules, but a broad knowledge of the intricacies of color will always be helpful. It is a safe thing to be conservative in the amount of second color used. Conservatism also often means greater vividness, for a touch of color at

one place can often be more striking than an indiscriminate use. A touch of red in a trademark, a touch of brown in the belting, a touch of warm yellow in the headlight, a pen-and-ink automobile against an olive decorative background, a human interest panorama in color, are devices for the use of color. Some believe that the use of natural colors is best confined to higher-priced articles and for merchandise which gains in being shown "as is," but this is a matter of individual cases. Some believe that certain sections of the country are more favorable for the use of color than others. Certainly climate and race are important considerations. Latin-American countries are colorful and primitive peoples like prominent color of the purer hues. Then again it is necessary to consider the character of the store in which posters are to be used. For example, the department stores of the better class like more artistic combinations or subdued colors. On the other hand, the hardware dealer with his drab and somewhat cluttered stock desires the eye-catchers such as bright red, yellow, green and blue against white, gray or black.

In considering the use of color it is necessary to ascertain reasons for using it. Of course, in general color attracts but there are many other reasons. As a background it serves effectively in showing the product. Here it is an eye-catcher

and the product is depicted upon it where the eyes have been focussed. Certainly it is often inadvisable to go further with the color and supply competition where undesired. After getting the attention, the whole advertisement or display should be given a more or less equal chance. Often as a background for the product, package, or trade-mark a simple plane figure such as the circle is used. For such backgrounds red, orange, bright yellow, green, and bright blue are effective, although the color depends chiefly upon the article. Of course, a blaring red would be a satisfactory background for a safety device but would not be delicate enough for a pearl necklace. Thus heavy, rugged articles or products having to do with the sterner realities of life go well with the stronger purer colors but dainty articles and products having to do with the gentler side of life, should be coupled with more delicate tints and shades.

The character of the ink or paint is also important and a dull surface insures easier reading than a glossy one which is likely to reflect brilliant high-lights. Dull inks are best in printing, and distemper colors or colors compounded with pigments have come into considerable use in commercial art. They spread evenly and are excellent for flat backgrounds. There is a hazy atmosphere to these colors.

Esthetics and harmony of color are important factors in advertising copy as well as in decorative and lighting schemes for interiors. The problems involved may be solved by the experts but it should be borne in mind that the final make-up will be the result of a compromise of many factors as is true in most applications of knowledge. In many cases art must be subordinated to practicality and also attention-value; that is, to vividness and novelty. The artist even must learn not to shudder at incongruity. There are some cases where art is of primary importance in the appeal of an advertisement. Evanescent copy can be more daring; it may even be garish if attention may be obtained best by this means. But copy that is to live for years, such as packages, trademarks, slogans, cleverly suggestive pictures, must be of colors and technique which wear well.

Although it has been proved that color pages in catalogues outsell pages in black and white several times, there is little excuse for introducing color too generally for purely decorative effect. Of course, art is desirable but not without selling value. There are many cases where the color pages must have pleased the artist and are a monument to the printer's art, but their selling appeal is so weak as to make the reader wish that the money had been used to reduce the cost of the advertised articles. After color has achieved

its purely utilitarian possibilities, such as compelling attention and lending realism, it still has an office in impressing the reader with quality and similar characteristics of products and of advertiser. This is in a broad sense usefulness. In fact, color has no right to be used except in the broad sense of utility. If it does not serve a purpose which in some manner can be reduced to utility it has no right to be used. It should be used for sale's sake. See Plates IV, VIII, XV, and XVII.

If color pages are to be used in a catalogue for realism the other pertinent data should accompany the colored illustrations. Sometimes the mistake is made of not doing this and as a consequence the reader does not always follow up the inclination for further knowledge. In other words, when going to the expense of color the whole story should be available at a glance if possible. The use of color has so shortened the necessary description as to make this practicable in most cases.

There are limitations which restrict the creative artist in advertising but it is his job to create and to produce notwithstanding these restrictions. Few of the master artists of old were without restrictions even in their production of fine art. Ecclesiasts or other rulers and patrons dictated much. Doubtless they were as exacting and unreasonable as a modern advertiser, but still the

masters of the past produced fine art. The past masters produced fine work that is now priceless because they considered such work was the greatest art job to be done. Still, most of their work was in a sense advertising, for their paintings were of historical and religious subjects for the walls of churches, convents, monasteries, etc. If commercial art would be considered of the same eminence, master-pieces would be adorning our pages, billboards and street cars. A few centuries ago the field for the artist was the church; today it is in merchandising.

The master artist and the advertiser are still generally far apart. They have not yet sought each other. The artist has not generally felt that commercial art is worthy of his effort and the other has not felt that the artist's effort was worth obtaining. The artist would rather paint antiquated fishing boats instead of modern motor cars. The advertiser thinks that the artist is impractical. It is fine that this is so if it does not prevent their getting together. Advertising can do a great deal to popularize painting because it can appeal at least with the guarantee of a good living. Photography and many influences have made the field of art for art's sake small. When advertisers are willing to pay ten thousand dollars for a page in one of our magazines, maybe they will some day realize that it can be worth the price





(Courtesy of Onondaga Pottery Co.)

PLATE XVIII

When a product is beautiful it is a good subject for representation in color.

only when the best of art work has been put into the copy.

One expert¹ recently critically examined forty-six color pages in a leading magazine which cost the advertisers using them, eleven thousand dollars per page. He classified only twelve as good advertising art. In thirty-four he considered the color used so badly that it would have been better to have used black and white. The color plates per page cost from \$250 to \$400 and it seems obvious that many of these advertisers paid less for the design than for the color plates. Of the forty-six designs, eighteen were signed by the artists; in other words, twenty-eight were anonymous. In these twenty-eight cases representing an outlay of about \$300,000 in advertising, either the artist did not think enough of his work to sign it or the advertiser did not think enough of the artist to have him sign it. This speaks eloquently. See Frontispiece, Plates I, IV, XI, and XV.

The work of the few real artists in commercial art is proof of the intrinsic value of quality and the charm and power that go with it. The designs are often wholly beside the subject but they have their influence. They have the potential power which if unleashed by encouragement would tell the stories of advertised products as they were never told before. It is the belief of a few emi-

¹ E. E. Calkins, *Printers' Ink Monthly*, Nov. 1920, p. 19.

nently qualified persons at least, that commercial art offers to the artist an opportunity as great and as worthy as ecclesiasticism offered the artist of five centuries ago. Of course the best advertising art will generally be produced by artists who have trained for it; by artists who have been in touch with what advertisers want to do. Just think of what the masters could do if there was a bond of sympathy and understanding between fine art and advertising. This may give some idea of the distance we still are from the goal.

Certain individuals still pose as being horrified at the "sacrifice" that real artists have made by contributing their efforts to commercial art. At least commercial art has profited greatly by this introduction of the artist's talent and perhaps the talented have also profited if in no other way at least by being enabled to have some of the good things that money will purchase along life's highway. Furthermore, it is not proved that the field of fine art has suffered by these sacrifices, therefore, it seems to be a profitable venture with no apparent losses. These better artists have helped to introduce some ideals into merchandising. They have helped to make men and women desire to be better dressed and to feel so after the purchase. They have striven for broad effects and have done much with color. Some of them have introduced technique of the highest order. Where

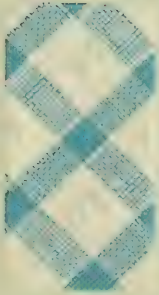
monotone is necessary they have rendered in etching and wood-cut effects the texture and pattern and sometimes even the suggestion of the coloring. Let us hope that the fine sensibility and technique of the real artist will always be attracted to the field of commercial art to a sufficient degree to maintain a high standard.

CHAPTER IX

LIGHTING VERSUS PIGMENTS

IN THE preceding chapters many characteristics and possibilities of color have been presented. Although these have been discussed from the viewpoint of the use of color as a medium of printing and of painting, most of the characteristics and possibilities of color have applications in the field of lighting. The one viewpoint was maintained in the preceding chapters for the sake of simplicity of treatment, but in the chapters which follow these data are extended into the field of lighting with the aid of further discussions peculiar to this field. The present chapter is a modulation from pigments or reflected light to lighting or primary light. This distinction is a loose one but nevertheless a real one. In other words, the effect of pigments in painting and in printing is due to light, for light is reflected (or transmitted). In lighting we deal with the primary light, coloring and distributing it as we desire and illuminating what we choose. An effect produced by means of printing or painting is fixed, and furthermore it depends upon light

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PLAIN WHITES

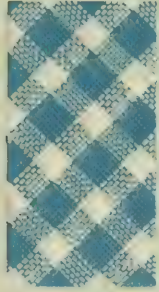


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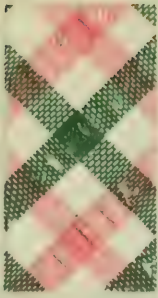
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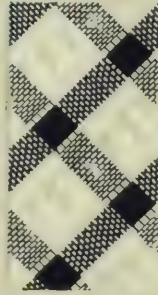
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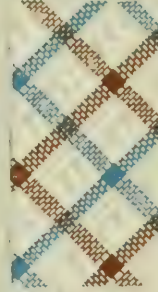
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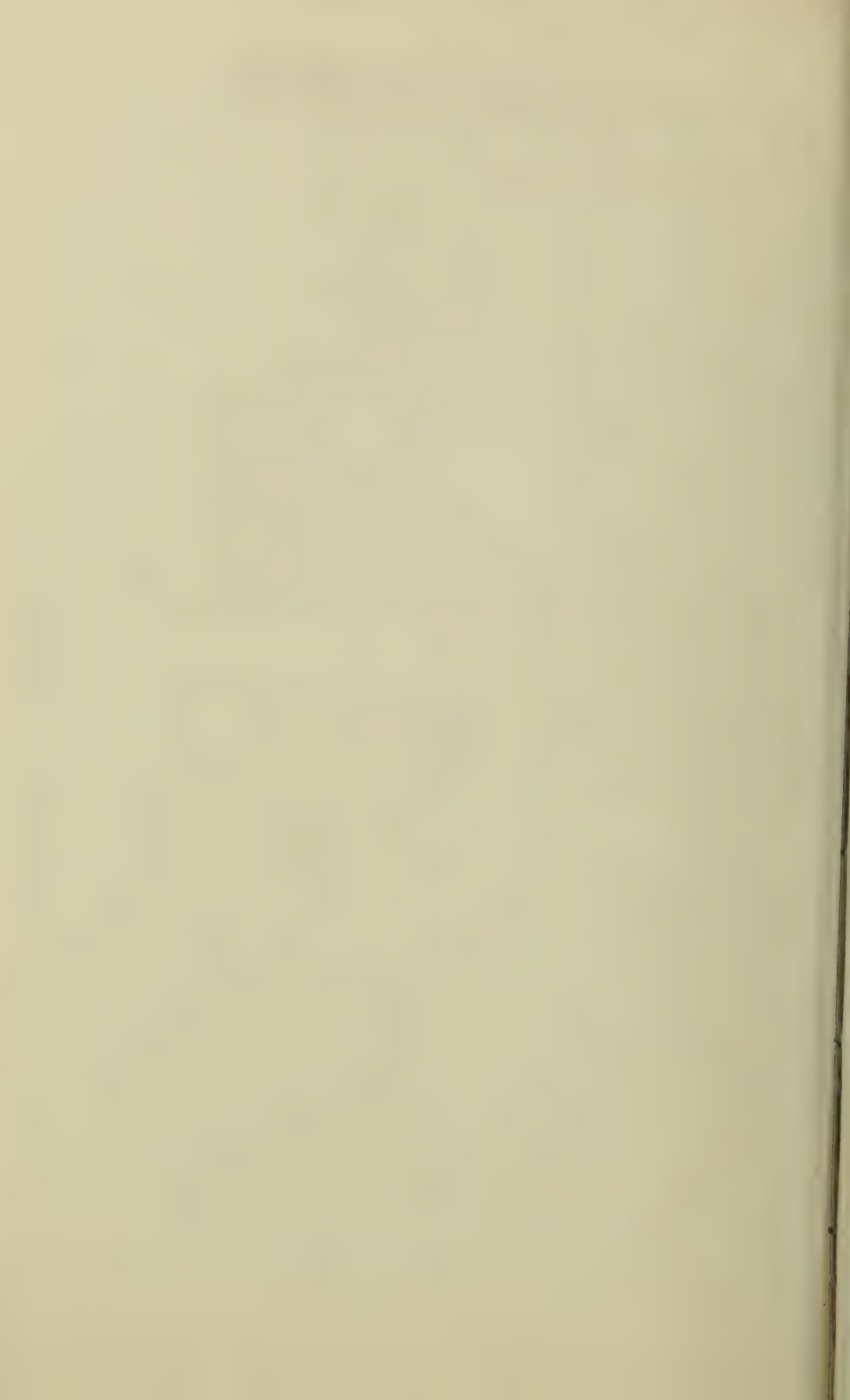
PATENTED DEC. 17, 1912. AUG. 7, 1917. BY

SIMPLEX SAMPLING ASSN., INC., NEW YORK.

PLATE XIX

(Courtesy of Simplex Sampling Assn., Inc.)

This combination of color lithography and embossing by a patented process depicts textiles with remarkable realism.



and lighting for its appearance. However, light is a mobile medium and its effects are more powerful. A discussion of lighting versus pigments is helpful in many ways.

A poster, a painting, an interior decorative scheme is in itself fixed and it also has limitations which primary light and lighting effects do not have. For example, the whitest so-called "white" that is found in practice is only about thirty times brighter than the ordinary so-called "blacks" under the same intensity of illumination. Under the same conditions the brightnesses of all colors lie between these two extremes. In other words, if so-called white and black pigments are painted side by side and viewed under the same lighting condition, the contrast is only about thirty to one. Thus the relative values which the artist can command in the same painting are limited in this manner. If we illuminate the black and white patches unequally this contrast changes. That is, we can throw so much light on the black patch that it will appear very bright and even white in comparison with a weakly illuminated white patch. On the other hand the white can be so highly illuminated and the black so weakly illuminated that the contrast is thousands and even millions to one. In fact, by introducing the factor of primary light or lighting, the possible contrasts are almost unlimited. Thus we have greatly ex-

tended the possibilities of expression by means of light and color.

So-called black pigments are far from black; that is, they reflect some light. The darkest patch that we can devise is a hole into an interior lined with black velvet.¹ This is almost a true black. It is instructive to line a box with black velvet and to cover one end with black paper or even black velvet in which a hole is cut. The hole is much darker than its surroundings. This is a device worth knowing when great contrast is desired. With primary lights we have a range of contrast from the nearly perfect black, where we have reduced the reflected or transmitted light as nearly to zero as possible, to the bright source of light itself whether it be an incandescent filament or even a brighter source. This indicates a potentiality possessed by primary light that is not possessed by reflected light or pigments.

It is interesting at this point to briefly consider transmitted light. Here we also find much greater possibilities of expression than in the case of reflected light. For example, a transparency which is receiving light only from the side opposite the observer may be opaque in spots and still be of a very high brightness in others. A lantern slide may show a contrast range of one thousand to

¹ *Light and Shade, and their Applications*, by M. Luckiesh, 1916, p. 56 and 199.



(Courtesy of Knox Hat Co.)

PLATE XX

Red as a second color is very appropriate in this case for, besides increasing the attractiveness of the advertisement, it provides the flesh tint.

one. In fact, it is easy to obtain very much higher contrasts.

In lighting effects we may have dark shadows receiving practically no light and at the same time have brilliant highlights. The latter may be highly illuminated light-colored surfaces or even the intense sources of light themselves. Here we have a potentiality not possessed by reflecting media in themselves.

Thus it is seen that primary light or lighting has a potentiality far exceeding a painting or a printed page and that transparencies also enjoy an advantage in this respect. This is one of the chief reasons for the greater impressiveness of the original than of a reproduction of it by photography, painting or printing. This is also the chief reason for the greater effectiveness of a well-done transparency over an opaque picture which is viewed by reflected light. This discussion not only points to the handicaps of paintings and printings but also illustrates the advantages of dealing with lighting effects and displays of actual articles. Knowing these advantages and disadvantages the advertiser and merchandiser can get the most out of the various media and in many cases select a medium more wisely.

THE NUMBER OF DISTINGUISHABLE COLORS

Perhaps at this point it should be pointed out that color is in reality in the light and not in the object. For example, sunlight, skylight, or the light of most of our ordinary artificial illuminants consists of many colors. When this light is dispersed or decomposed into its components by means of a prism or other device we see a colored band called the spectrum. When sunlight passes through raindrops we have the rainbow, which is in reality decomposed or dispersed sunlight. If we examine this spectrum closely we see a blending of colors beginning with violet and passing successively through blue, green, yellow, orange and red. The most conspicuous spectral colors are red, yellow, green, and blue. In these we do not see a suggestion of any other colors. Newton, who discovered the spectrum, gave to it seven color-names. This was unfortunate for it has caused no end of difficulties. The number of distinctly different hues which we can distinguish in the spectrum depends upon the delicacy of the optical instrument which is used. It is not difficult to distinguish one hundred different hues in the spectrum and with the finest instrument about one hundred and fifty different hues are visible.

It may be well at this point to point out that the class of purples, which also includes rose, pink,

lavender, etc., does not exist in the spectrum. They consist in general of combinations or mixtures of blue and red of different proportions. If we add the number of distinctly different hues of purple to the one hundred and fifty distinguishable hues in the spectrum we have about two hundred hues that are distinguishable from each other.

It aids in visualizing the various hues to arrange them around a circle in proper sequence. Beginning with the red end of the spectrum we end with blue and violet about three-fourths of the way round the circle. The remaining gap is filled with a proper sequence of purples. To aid anyone in constructing this so-called color-circle the chief colors are presented in their proper sequence as follows: red, orange, yellow, green, blue-green, blue, violet, purple, red-purple. When we dilute each of these hues (approximately two hundred) with increasing amounts of white light we obtain a long series of tints in each case. When we further consider decreasing or increasing the brightness of each one of these tints so that we have a series of shades in each case, it is easy to see that we have a great number of perceptibly different colors. Knowing the minimum perceptible difference in hue, in tint, and in shade, it is possible to compute how many different colors the eye can distinguish. For the present purpose it will suf-

fice to state that we can distinguish millions of different colors. This number is greatly reduced if we confine our attention merely to reflecting colors viewed on a surface of a certain intensity of illumination. But when lighting is considered and we alter the illumination and choose our hues from the spectrum, and the purples obtained by mixing spectral colors, the maximum number is obtained.

PRIMARY COLORS

Many of these points, including color-mixture, have been discussed extensively elsewhere,¹ but they are very briefly touched upon here to give the reader a view into byways which if followed will yield the advertiser and merchandiser much of value. The mixture of colors for the same reason will be discussed briefly. There is no phase of color so misunderstood as the underlying principles of color-mixture but only the simplest discussion of the fundamentals is presented here.

Most persons arrive at their scanty knowledge of color-mixture through the use of water-colors or pigments and owing to certain misnomers confusion is widespread. Furthermore when colored lights are to be mixed the error is commonly made of basing these mixtures on the principles of mix-

¹ Color and Its Applications, M. Luckiesh, 1915 and 1921.

ing pigments. Many books by artists contain glaring errors in regard to color mixture.

In mixing two pigments or dyes the resultant color is approximately that which is common to both of them; all other components disappear by subtraction. For example, if yellow and blue-green pigments are intimately mixed the result is green owing to the fact that this is the color transmitted and reflected commonly by the two pigments. This principle can be demonstrated by superposing colored glasses or gelatines or by glass cells containing dye-solutions. The artist's primary colors or the primary colors of the subtractive method are commonly named red, yellow, and blue. They are more accurately designated as purple, yellow and blue-green. A little study will show that by mixing red and blue we should obtain approximately black. It is true that very thin layers of these superposed will give dark shades of purples.

The subtractive primaries or those used in mixing dye-solutions and paints and demonstrated by superposing colored glasses, gelatines, etc., are purple, yellow, and blue-green. When these are mixed in proper amounts we obtain various combinations a few of which are as follows:

Purple and yellow = red
 Yellow and blue-green = green
 Blue-green and purple = blue

The test of primary colors is that they shall be able to make by mixture any hue desired. This is true of purple, yellow and blue-green. If the so-called red which the artist claims as one of his primaries is closely examined it will be found to be a red-purple. Likewise his primary carelessly called blue is in reality a blue-green.

When we mix colored lights we encounter another principle, that of adding colors. For example, if we let red light fall on a white surface and then let green light fall on the surface we will have yellow as a result. The hue of the yellow will depend upon the particular combination or proportions of red and green lights. It has long been known as a scientific fact that the three primary colors which by adding in various proportions will produce any hue desired, are red, green, and blue. In other words these pass the test required. The primary colors of the additive method when mixed or added to their correct proportions give the following results:

Red + blue = purple

Green + red = yellow

Blue + green = blue-green

It is now illuminating to turn back to the combinations of the subtractive primaries. It is seen that pairs of primary colors of the additive method yield one of the primary colors of the subtractive

method. Likewise pairs of the primary colors of the subtractive method yield one of the primary colors of the additive method. This relation makes it very easy to remember the two sets of primaries. It is only necessary to examine the process involved to know what primaries are involved.

The subtractive method, whose primaries are purple, yellow, and blue-green, is involved in three-color printing, in painting, in dyeing, and usually in making filters for light-sources.

The additive method, whose primaries are red, green and blue, is involved in the mixture of light as on the stage, in the show-window, and in other lighting effects.

WHY DO OBJECTS APPEAR COLORED

Let us now pass on to the reason why an object appears colored. A red pigment or fabric appears red because it reflects only the red rays in the light which illuminates it. If the illuminant has no red rays as is the case with the mercury-vapor tube or a green incandescent lamp, the object does not appear red. It may appear nearly black with perhaps some residual color which it contains in common with the illuminant. A white surface appears white under sunlight because this is the integral sensation of all the colors of which that light is composed. It will appear red under red

light because there is only red light to be reflected. A pure red pigment on a white surface will be almost or entirely obliterated when illuminated by red light for the reason that the red spot reflects only red light and the white surface also reflects only red light because there is no other light in the red light to be reflected. The same discussion applies to other colors. Here again we see the superiority of lighting over pigments because the appearance of the latter depends upon the illuminant. This point can be easily demonstrated by viewing a series of colored pigments or fabrics under different illuminants. It is even striking to compare them under daylight and ordinary artificial light.

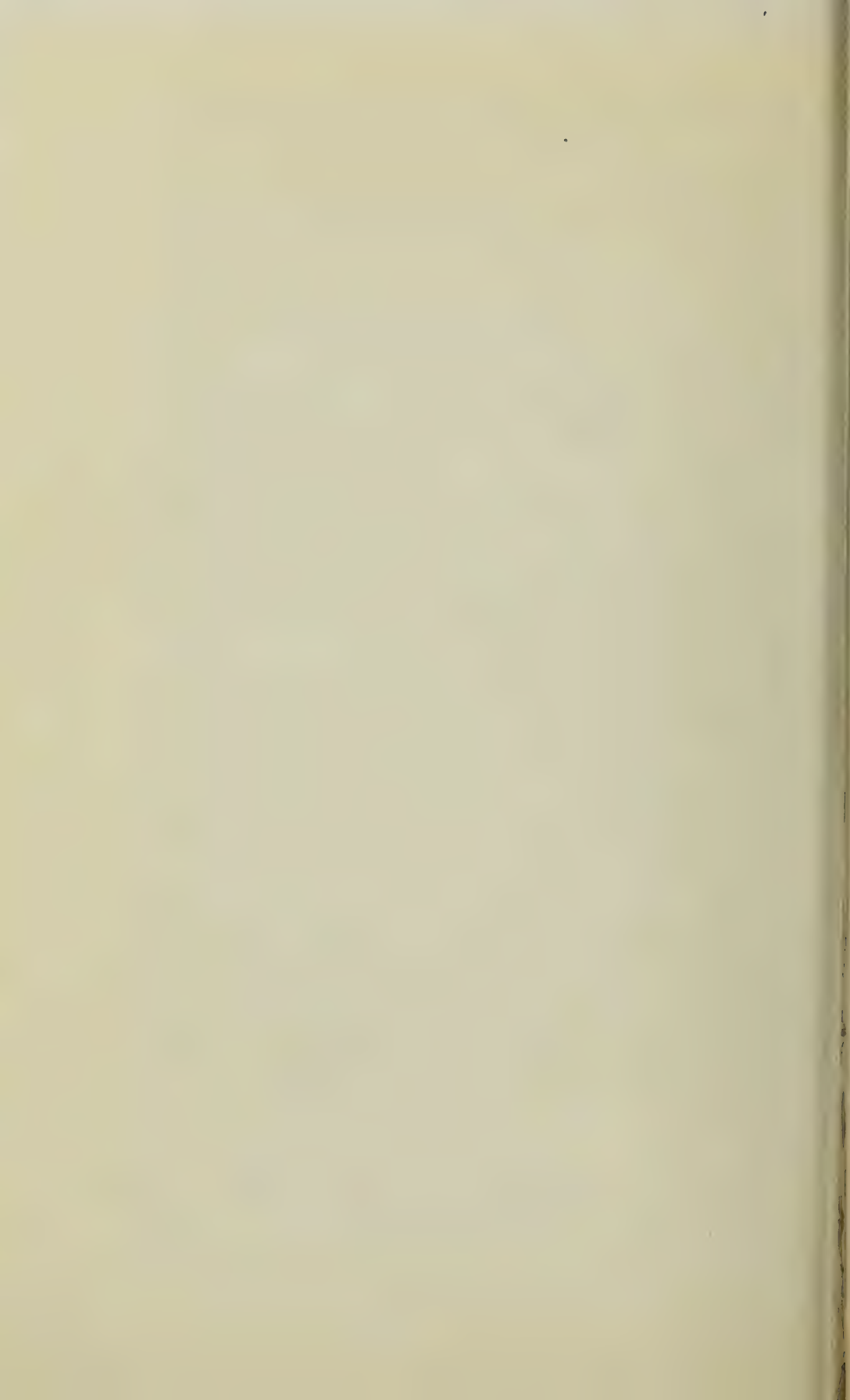
There is also another great difference between lighting and pigments, a lack of realization of which is responsible oftentimes for overdoing the use of color in lighting. For example, let us consider an interior. When a certain color motif is used, say rose, it is confined to certain areas such as draperies, upholstering and possibly sparingly on the walls. It is not generally enough realized that the color-scheme depends absolutely upon lighting. The rose owes its color to its ability to reflect only red and blue (or violet) rays in such proportions as to give the combined sensation of rose. The light reflected from the rose-colored areas is of a rose tint but inasmuch as these colors



(Courtesy of Anaconda Sales Co., through George Batten Co.)

PLATE XXI

Copper roofing described in black and white can not more than feebly suggest the beautiful colorings which the product possesses. Color-printing is a powerful ally in introducing such a product.



do not occupy overwhelming areas the rose tinge of this reflected light does not manifest itself strikingly upon other objects. Of course, if the light is confined solely to a rose-colored area the reflected light will be strikingly tinged with rose. But in the usual case this is not true so that faces and other familiar objects are not appreciably tinged with rose.

When the light itself is colored its tint modifies the appearance of everything that receives the light. In other words, if an incandescent filament is coated with a rose film or made of a rose-colored glass or completely surrounded with a rose-colored silk, all the light emitted is modified. Every object thus receives rose light. Therefore colored light is generally more powerful than colored pigments or fabrics in a color-scheme. For this reason colored light should not be used of the same purity or depth of hue as in the case of pigments. A lack of appreciation of this difference accounts for the garish effects of colored light often seen as compared with the relatively less violent decorative effects when pigments and fabrics are used. We have had many centuries of experience in the use of color in decorative schemes, but it is only comparatively recently that colored lighting has been practicable. Colored light has great potentiality but we must become acquainted with its peculiarities.

Let us go back again to the rose-colored wall-covering. If we have a ceiling of this color and use a so-called indirect lighting unit whose light is emitted upward to the ceiling, the light after reflection will be tinged a rose color. Now the light which is reflected downward from the ceiling is of a rose tint and this illuminates everything. The result is somewhat similar to that which would be obtained from an incandescent filament confined in a rose-colored bulb. The only difference is that in one case the tint was obtained by transmission through a rose filter (the bulb) and in the other by reflection entirely from a colored surface.

This brings us to a consideration of the purity of color as obtained by reflection and by transmission respectively. Light to be colored by reflection must penetrate appreciably into the colored media so that it actually passes through an appreciable portion of the film before it is returned, in order that it be appreciably colored. Some light is reflected by the surface and is uncolored. The light that is reflected after penetrating only to a small depth is only slightly colored. That which penetrates deeper is still more colored, and so on. Therefore the light as a whole is not as deeply colored as if all of it penetrated deeply before reflection. In the case of a colored glass, for example, all the light which passes

through it is completely and uniformly colored. For this reason in general we obtain purer colors by transmission than by reflection. Therefore colored lights appear of greater purity than colored pigments. This also accounts for the difference between dyes and pigments in general. Dyes are more transparent thereby permitting a greater penetration of light than the more opaque and diffusing pigments. For this reason dyes often produce more brilliant effects than pigments. This also indicates why colored paints differ so in appearance and also why the appearance of a colored object depends so much upon the character of the surface. Varnish makes paintings more brilliant because it reduces the amount of diffusely reflected light (which is uncolored) from the surface of the paints.

Unfortunately the knowledge of the optics of colored media is not very extensive among those who manufacture or use pigments, paints, and inks. Many of the "mysteries" are easily cleared up by acquaintance with the optical principles but it seems unwise to go into these tedious details here. However, owing to the increasing use of colored light, many questions arise as to the advantages and disadvantages of various methods of obtaining light by means of electric incandescent filament lamps.

OBTAINING COLORED LIGHT

There are three general methods; (1) colored accessories, (2) superficial colorings, and (3) colored glass bulbs.

In a comparison of the relative merits and the fields for these there are many viewpoints to be considered, the more important of which are presented with the hope of aiding the user to choose wisely the method most suitable for a particular purpose. Many demands for colored lamps arise from a lack of acquaintance with the colored glass accessories which in many cases offer a better solution of the problem and in the long run a less expensive and less troublesome solution. Furthermore, there appears to be confusion as to the merits of various coated lamps.

Colored Accessories. There are now available various colored-glass accessories which make it possible to use regular tungsten lamps for obtaining colored light in the show-window, on the theatrical stage, in signs, for displays of many types and in various interiors. Where the installation is to be operated more or less permanently such devices should be used wherever possible because the renewable part is merely a regular lamp. Furthermore, owing to the permanency of the colored glass, the maintenance of the installation is simplified and the trouble and the expense

of obtaining colored lamps are eliminated. These accessories are of various kinds.

Colored-glass caps are available in various colors and sizes for signs and these can be used in other places as well. These are increasing in number, in color, and in size.

Reflectors with colored-glass caps are available for show-windows for tungsten lamps of fairly large size. These may also be used in many other places where colored lighting effects are desired.

Reflectors and projectors, with colored-glass sheets or lenses in the aperture, are available for many purposes. These have been used on the stage, for flood lighting, and in large interiors.

Colored-glass lenses, roundals, sheets, globes, etc., are available for special purposes.

Colored gelatines of a variety of tints and pure colors, although not permanent, are quite satisfactory for temporary installations.

Practical devices of this character are increasing in number and many of the problems involving colored light can be solved best by using them rather than colored lamps. The colored-glass accessories can be obtained in relatively pure colors such as red, deep amber, canary, green and blue. Tints can be obtained by mixing uncolored light with the pure colored light. They can also be obtained from a single unit by using pieces of colored glass on a colorless diffusing glass. By

varying the relative area of colored glass the depth of tint can be controlled.

Colored-glass bulbs in a limited range of colors are available but, in general, most of the problems involving colored light can be solved without resorting to the use of the necessarily expensive lamps having bulbs of colored glass. There are some special uses where a colored-glass bulb is justifiable, but in most cases colored accessories or superficial colorings represent better practice. Where the space is extremely limited and the highest efficiency and permanency are desired colored-glass bulbs can be justified.

Superficial colorings for tungsten lamps can be subdivided into (1) solutions in which the lamp or other device is dipped and (2) liquids containing suspended pigments which are sprayed on the lamp.

The solutions applied by dipping generally consist of a celluloid or varnish vehicle in which aniline dyes are dissolved. It is possible to grind insoluble coloring materials, such as pigments, fine enough so that they are held in suspension in these vehicles. The aniline dyes are not permanent under the influence of heat and light. Therefore these "dips" are not satisfactory on large tungsten lamps which are quite hot. In general they fade somewhat even on the smaller vacuum lamps but owing to the relatively lower temperature of

these bulbs, they serve many purposes satisfactorily on these lamps. Even the vehicles used for dissolving the dyes usually disintegrate or "scorch" when used on large lamps. Therefore if an insoluble permanent pigment is held in suspension in such a vehicle as celluloid or varnish, the permanency depends upon the vehicle. The aniline dyes provide pure colors such as red, orange, yellow, green, and blue and by diluting and mixing them a very great variety of tints is obtainable. Colored lights must be at least fairly pure in color in order to obtain the variety of tints by mixing them as is done on the stage, in the moving-picture theatre, in the show-window, etc. A certain degree of diffusion is obtainable by this process if desired, but in many cases where the lamps are used the transparent coloring is quite satisfactory.

The spray process was developed by the writer in order to be able to use materials which would be permanent on large tungsten lamps. The insoluble but permanent coloring materials were finely ground and suspended in a certain vehicle which was found to be permanent. It combines permanent diffusing and coloring materials with a permanent vehicle.

When experimenting with this process many years ago it became evident that tinted light could be obtained efficiently in this manner but that the

more or less opaque insoluble coloring media would not yield relatively pure colored lights very efficiently. For certain physical reasons involving the translucency and the opacity of the coloring materials, extremely pure colored lights such as red, green, and blue cannot be obtained by this process when these more or less opaque coloring materials are used. And for the same reasons even the lights of the deeper tints are produced less sufficiently by this process than by means of dyes or colored glass. However, there are many places where the sprayed coating containing pigments is quite satisfactory when convenience and permanence are arrayed against inefficiency. Aniline dyes and colored glasses produce lights of pure color more efficiently than the translucent sprayed colorings, involving insoluble coloring material, produce even the deep tints; but the dyes are not permanent on hot lamps. They have been used with success on the smaller lamps in outdoor signs and in many places where permanency is not a primary factor.

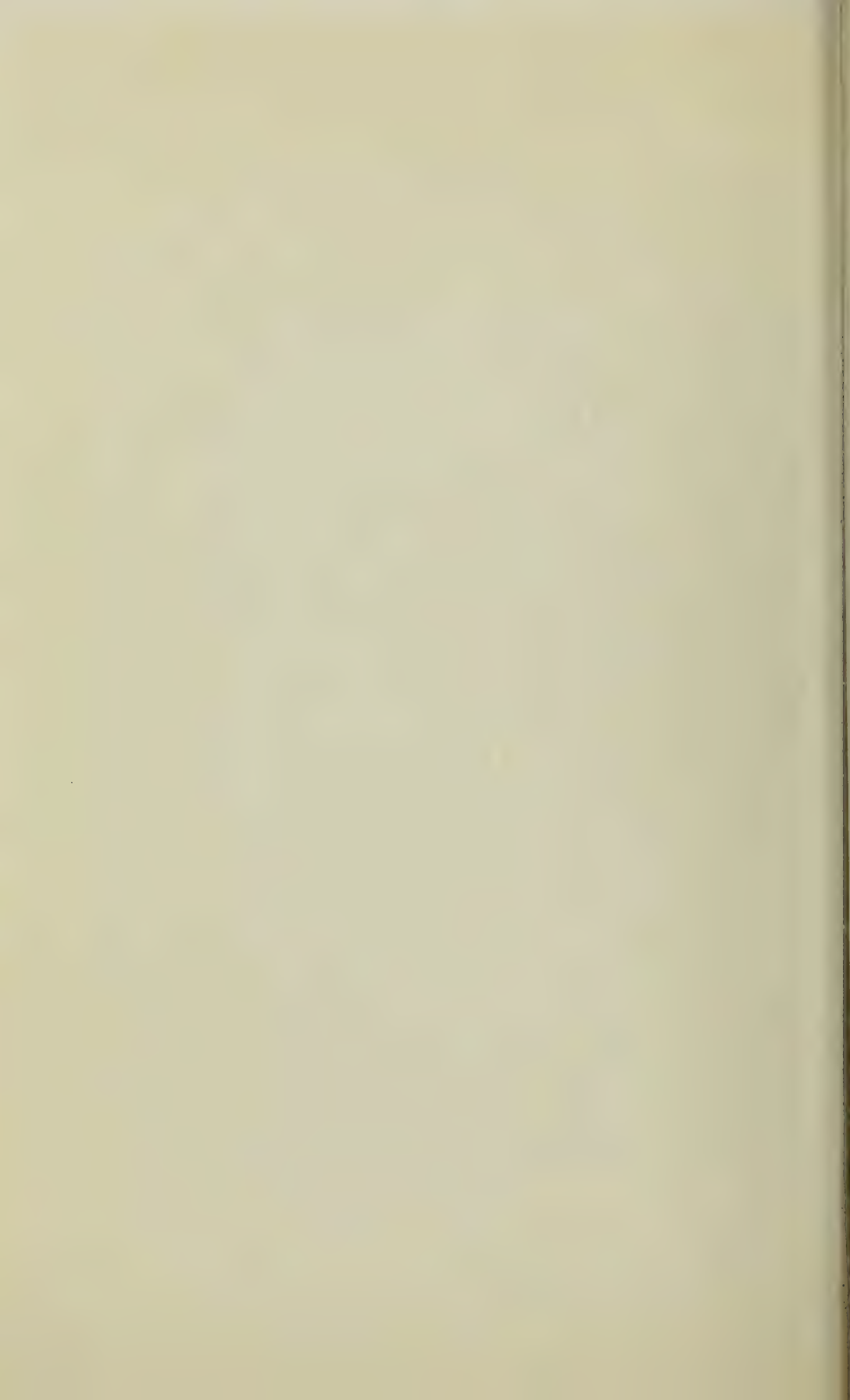
Wherever possible the coloring element should be an accessory of colored glass. By mixing the available colored lights many effects can be obtained as already indicated and as is discussed in later chapters.



(Courtesy of Mr. W. D'A. Ryan)

PLATE XXII

The expressiveness of light has been utilized on a tremendous scale by Mr. W. D'A. Ryan on many occasions. Among his many developments is the scintillator consisting of great jets of illuminated steam. Here is illustrated the Zone "salvo" at the Panama Pacific Exposition in which search-lights aggregating over $2\frac{1}{2}$ billion beam candle-power were used.



CHAPTER X

THE SHOW-WINDOW

THE show-window in which merchandise is displayed is, in many ways, the next step beyond the magazine or billboard advertisement. Also its presentation of the actual merchandise is, in many respects, the ideal toward which the printed and pictorial advertisement should strive to approach. For this reason much of the material of previous chapters is applicable, either directly or with judicious modification. On the other hand there are many differences in the two media for presenting merchandise, its qualities and its uses, to the consumer. Furthermore, in the case of the show-window we are not confined strictly to the field of advertising for we begin to enter the field of merchandising. In other words, the show-window is not a purely advertising medium in a narrow sense. It is the finger-print of the store. Its displays indicate the atmosphere of the particular store. It is the welcoming hand of the merchandiser. All the principles of the esthetics and all the characteristics of color are involved and besides arrangements and setting,

we have the additional possibilities of modern lighting which are now very extensive. From the standpoint of arrangement and setting the show-window in the hands of the best display artists has advanced very much but the potentiality of lighting has barely been drawn upon in this field.

A shirt company operating a chain of stores in large cities state that they "depend to a very great extent upon show-windows to attract both transient as well as resident customers. They have found that the use of "high-intensity" window lighting from early in the morning until after midnight, even though the stores are not open in the evening, results in more business than when the windows are artificially lighted only in the evening." They also point to the days of coal conservation during the war when artificial lighting was curtailed. When they "cut out the window lighting, business dropped off considerably. When the order was repealed business picked up immediately." The company further states that in their business "it is possible to greatly improve upon the natural daylight available by using artificial light." This is typical of many expressions of modern merchandisers. Of course, the use of artificial light in the show-windows at midday depends upon local conditions.

INTENSITY OF ILLUMINATION

Let us first begin with a consideration of intensity of illumination. Any observing merchant knows that the intensity of illumination in show-windows must be much greater in the white-way region of a city than in the side-streets or outlying districts. A window on a side street which may appear brilliantly illuminated with an intensity of a few foot-candles will be dingy and lacking in attention-value along the white-way where the brilliant signs and high-intensity street lighting are overpowering. The best rule for determining the proper intensity of illumination is to depend upon an actual observation of the window at night amid its particular environment. Even in the same block the required intensity will vary depending upon the location of brilliant signs and of high-candlepower street-lamps. The intensity of illumination of show-windows along the white-way district should usually be several times greater than that considered satisfactory in the store.

Certainly it does not require particularly keen observation to conclude that the attention-value of a show-window increases with the intensity of illumination, other conditions remaining the same. In fact, it is a common experience to see persons attracted to a bright window while a dingy window near at hand may be deserted. It has been

demonstrated in many ways that light is stimulative and attractive and inasmuch as relative values are usually the more important in the appraisal and effect of light, it is to be expected that the more brilliantly a window is illuminated the more persons it will attract. Even in stores, increase of sales has been found to follow an increase in the intensity of illumination.

Recently some extensive investigations have been conducted to ascertain the relation between drawing power and intensity of illumination in show-windows. The results of two of these¹ will be presented as typical of approximately what may be expected with an increase in intensity in show-window lighting. Those unfamiliar with the value of illumination represented by a foot-candle need not become uneasy when this unit is used. It is easy to measure and, after all, the results can be judged as well from the standpoint of relative values as of absolute values. It may aid somewhat in visualizing the foot-candle by considering it to be approximately the illumination obtained at a distance of one foot from a lighted ordinary candle about one inch in diameter. Furthermore, the average person generally reads at night under an intensity of a few foot-candles.

The investigation under consideration was conducted in two cities and involved a long series of

¹ W. Sturrock and J. M. Shute, *Trans. Illum. Eng. Soc.* 1922.

tests at different hours of the evening and under a variety of weather conditions. Each of two windows of the same store was equipped with lamps sufficient to give the desired intensities. Throughout some of the tests one window was illuminated at a different intensity than the other and in other tests they were at the same intensity. A total of fifty test-periods was run and the number of persons passing by varied from 600 to 4400 per hour. From 10 to 20 percent of the passersby were attracted to the window depending upon the intensity of illumination. Furthermore, the mean drawing power of these windows increased about 33 percent when the intensity was increased from 15 to 40 foot-candles; and about 73 percent when the intensity was increased from 15 to 100 foot-candles.

A summary of the results for the windows for two different stores is presented in Table IX.

TABLE IX.—RELATION BETWEEN INTENSITY OF ILLUMINATION AND THE DRAWING POWER OF SHOW-WINDOWS.

Illumination in Foot-Candles	Percentage of Passersby Attracted (<i>A Cleveland store</i>)	Relative Drawing Power
15	14.2	100
40	17.4	122
100	20.9	148
	(<i>A Newark, N. J., store</i>)	
15	9.0	100
40	13.9	154
65	14.2	160
85	15.9	178

What this increased drawing power means in dollars to the merchandiser can be computed very rapidly. The proprietor of the Cleveland store considered that it would cost him in profit ten dollars per hour to leave unlighted one of his 29-foot windows in which he uses an intensity of 40 foot-candles. This valuation was confirmed by other merchants in the same locality. Assuming that show-windows are illuminated on an average of 2000 hours per year the profit accruing to the merchant from a 20-foot window and the cost of the lighting are presented in Table X for three intensities of illumination.

TABLE X.—RELATION OF INTENSITY OF ILLUMINATION TO THE PROFITS FROM A 20-FOOT SHOW-WINDOW.

Illumination in Foot-Candles	Relative Drawing Power	Annual Cost of Lighting	Approximate Annual Profits.
15	100	\$ 70	\$15000
40	133	160	20000
100	173	400	26000

An advantage of being able to obtain high intensities of illumination is recognized when very dark goods such as some furs are to be displayed. In order to see the texture and color of dark goods clearly a much higher intensity is necessary than in the case of light-colored goods.

CONCEALING THE LIGHT-SOURCES

Not many years ago the lighting of show-windows was so badly done that it was referred to whenever an illustration of incorrect or glaring lighting was desired. The tendency was to place the light-sources without any attention to the eyes of the observers. Bare unshielded light-sources hung before the eyes or studded the outline of the glass. The display-man had not learned that the better rule was to throw light on the merchandise and not on the eyes of the observer. In recent years the stores of the better class have concealed the light-sources fairly well, but many windows still advertise or display modern light-sources to better effect than they do the merchandise.

The progress toward concealing light-sources has been so great that at the present time the mark of a quality store is generally the absence of glaring light-sources.

Of course rows of bare lamps attract people just as they attract moths and June-bugs. But the office of a show-window is to attract observers and then to display merchandise. Perhaps cheap jewelry stores can justify such lighting for the windows because glitter is the life of such merchandise; however, all the charm of glitter due to many light-sources can be obtained if the merchandise alone "sees" these sources. It is obvi-

ous that in many such stores rows of unshielded sources are used intentionally but in many other cases this is done through thoughtlessness or ignorance of the consequences. There seems to be little justification for such lighting. Certainly it is glaring and the resulting glare reduces the ability to see the merchandise. And finally such lighting is seldom taken as the mark of a quality store.

There are many reflectors available for the show-window and the choice depends upon the vertical cross-section of the window. For the high shallow window an intensive reflector which sends the light downward and backward is desirable. For the low deep window an extensive reflector is available which spreads the light backward. Between these extremes of dimensions there are also reflectors which are suitable. The development of lighting equipment has reached the stage of satisfactoriness where manufacturer's catalogues and representatives are in a position to solve any of these problems. The merchant only needs to know that these facilities are available and to be wise enough to call in an expert to specify the equipment for his particular needs. This also applies to display-cases in the store.

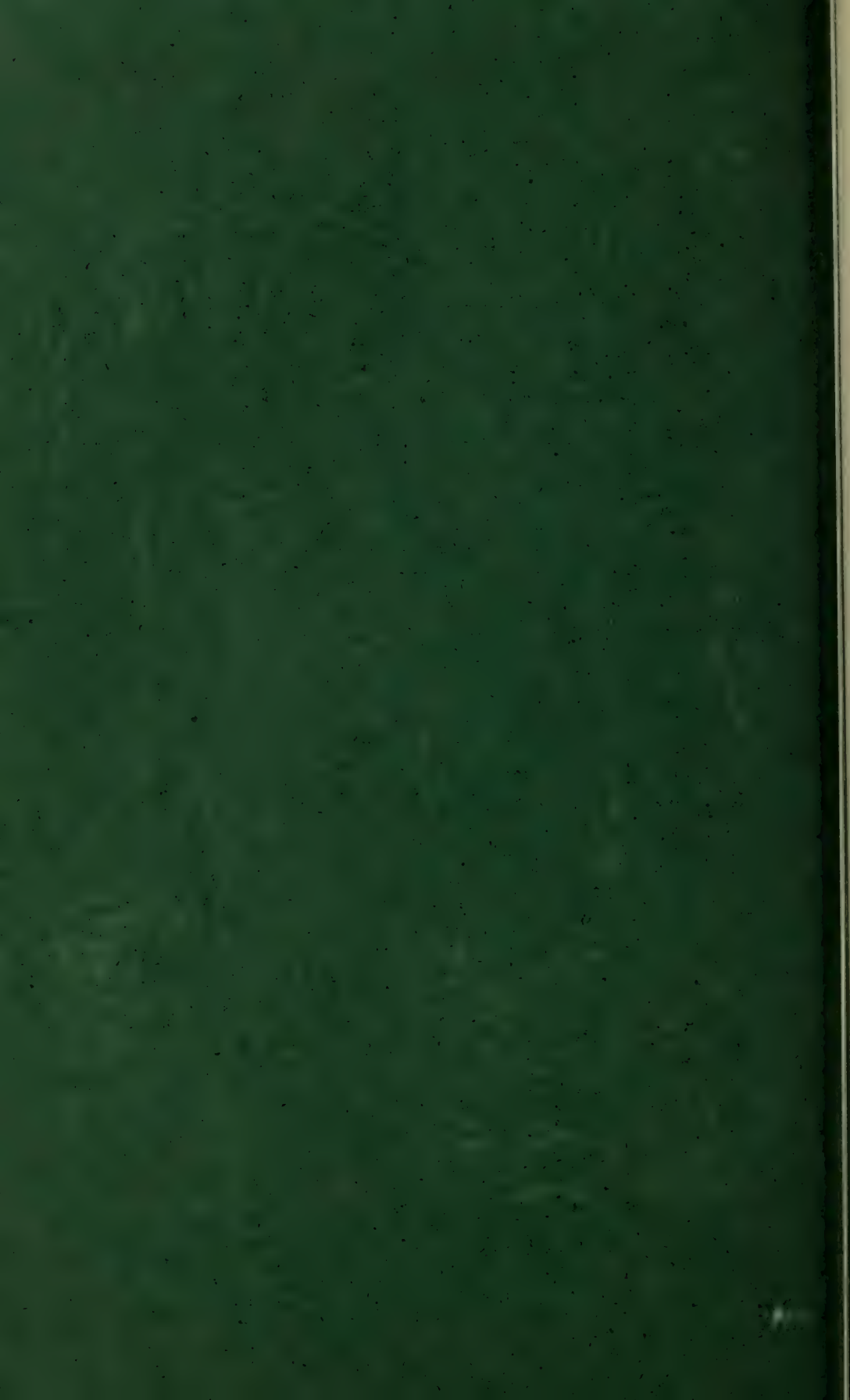


(Courtesy of American Writing Paper Co.)

PLATE XXIII

Colored paper simplifies color-printing and is particularly useful for decorative effects.

This insert is Paradox Cover, the third cover grade of Eagle-A Quality-Standards,



A MINIATURE STAGE

Although in the windows of the better stores the light-sources are generally concealed and proper reflectors are used, the wiring and equipment are not adequate for utilizing the potentiality of lighting to its full extent. Usually the lighting equipment consists of one circuit supplying a row of lamps and reflectors at the upper front of the window. Ofttimes the size of wire is insufficient to supply the lamps required to provide the intensities of light now feasible and desirable. If the wiring permits, the merchant at least is able to take advantage of the increased pulling power due to increased intensity. However, the show-window should be considered a miniature stage where the expressiveness of light can be utilized as effectively as it is on the theatrical stage. The potentiality of light is far greater than anyone realizes who has not been in a position to experiment with and to develop its possibilities.

An ideal show-window would be equipped with several circuits overhead; with footlights well concealed in front at the bottom; with some well-concealed units at the sides if possible; and with a spot-light or two hidden overhead. The circuits overhead make it possible with the modern lighting equipment having colored filters (preferably of colored glass) to utilize floods of colored light

as deeply tinted as a particular display demands. The foot-lights are for the purpose of sending a sufficient amount of light upward and backward to illuminate the shadows caused by the dominant downward light. On the stage the foot-lights are usually a necessary evil. They produce unnatural shadows but it is difficult to obtain satisfactory predominant lighting from overhead and sufficiently in front of the setting. This is not true in the show-window but it is often desirable to have some light from the foot-lights. The side-lights should not be installed unless they can be well concealed. If so they should be placed high and used only to give dominant oblique shadows which are natural and often desirable. They are the least necessary lighting equipment in the show-window. There are several compact spot-lights available for show-windows and these are particularly effective in picking out or emphasizing the chief object of the display. They are especially desirable when floods of colored light are used. See Plate X.

The modern artificial-daylight lamps have been used effectively in show-windows. They provide not only a distinctively different light than ordinary lamps, which makes the window conspicuous among its competitors, but this white light reveals colors with fidelity. Daylight lamps are particularly effective for white goods, for delicately tinted

fabrics, and for very dark merchandise such as furs. They have solved many problems of displaying merchandise in true colors. Owing to the "colder" appearance of the window under the light from daylight lamps it is well to hang some "warm-colored" draperies in the background or otherwise to add some warmth to the general effect. In some settings the "coldness" of the artificial daylight is extremely desirable. The daylight lamp is illustrated in Plate VI.

With modern lighting equipment which includes filters for obtaining colored light it is possible to obtain any color of light and any depth of tint. These filters can be obtained as colored-glass accessories in the form of caps, globes, disks, and plates, depending upon the reflector and in such colors as red, amber, green, and blue. These are sufficient to obtain by mixture any tint desired. By mixing uncolored light, which we will loosely term "white," with a colored light a tint will result. The following are examples of the results of mixture of colored and uncolored lights emitted by lamps of a uniform wattage.

Red tint — One white and three or more red.

Rose — Red and blue mixed and diluted with white.

Orange — One amber and two red.

Yellow tint — Amber and white in equal number.

Green tint — One white and four or more green.

Yellow green — One amber and three green.

Greenish blue — One green and three blue.

Blue tint — One white and five or more blue.

Violet — One red and several blue.

The foregoing are merely approximations. The actual proportions will depend upon the purity of the colored lights available. It should be remembered that in obtaining the colored light a great deal of light is sacrificed. A fairly pure red should be obtained by means of a red filter about 15 to 20 percent of the light from a clear-bulb tungsten lamp. A fairly pure amber, about 40 to 60 percent; green, about 5 to 10 percent; and blue, about 3 to 5 percent. These values will give some idea of the relative intensities of the colored lights compared with the unmodified light from the same light-sources.

Although in using colored light the wattage should be considerably increased, still we cannot hope to maintain the intensity of illumination considered necessary with unmodified light. Fortunately this is not necessary because colored light has an attractiveness quite aside from its intensity. In the investigations of the pulling power of various intensities discussed earlier in this chapter, some tests were made with colored light as compared with unmodified light from the same wattage of lamps. It was found that colored light and

spot-lights had a greater drawing power than the same wattage of unmodified light.

In one store one window was illuminated to an intensity of 65 foot-candles and an adjacent window was illuminated by colored light and spot-lights aggregating the same wattage as used in the first window where only unmodified light was used. The second window containing colored light and spots showed a drawing power 36 percent greater than the window using unmodified light of the same wattage.

In another store one window was illuminated to the intensity of 100 foot-candles of unmodified light. In the adjacent window the same wattage was used but the light was colored and spotlights were suspended in each window to direct a beam of light on the central figure. In this case the window containing the colored light and a clear spotlight directed upon the central figure of the display showed a drawing power of 44 percent greater than the window in which unmodified light of equal wattage was used.

Notwithstanding the fact that the same wattage was used, and as a consequence the intensity of illumination was very much less in the window in which the light was colored, this window was appreciably superior in each case to the window in which the light was not colored. This shows, as might be expected, the attractiveness of color. Of

course, there still remains the question of selling power. This is largely in the hands of those responsible for the lighting effects. If the colored light is used appropriately so that those attracted are not disappointed, the selling power should go hand in hand with drawing power. There have been many misuses of colored light, some of which are discussed further in another chapter.

BACKGROUND

The background of a display-window is very important in various ways. Obviously if it were a mirror the observer looking into the window could see the images of the light-sources which are screened from direct view. For this reason a smooth surface for the background will reflect high-lights which are imperfect images of the light-sources. Not only are these glaring and distracting but in a sense they spoil that touch of mystery which generally accompanies "concealed lighting" of this sort. The imperfect images reflected by a smooth or polished background are more prominent and glaring when the background is dark than when of a light color. This is because of the much greater contrast between the reflected images and the background in the first case. Dark backgrounds do have the excellent quality of providing a striking contrast of the merchandise, with the result that merchandise "stands out" promi-

nently. When the object of the display is not solely one of showing merchandise, the background with the furnishings of the setting is a very important factor. Under these conditions a great variety of treatments is possible.

In the investigations already commented upon some experiments were conducted with backgrounds of different brightness which yielded interesting results. Before discussing these it is well to distinguish between illumination and brightness. Illumination depends upon the amount of light *received* by a surface; the brightness of a surface depends upon the amount of light *reflected* (or emitted) by a surface. For example, a surface painted white and one stained a dark mahogany will differ greatly in brightness even though receiving the same quantity of light per unit of area. The white surface will reflect as much as ten times more than the dark mahogany surface. It might appear that the brighter the background the greater the drawing power of the window might be. As a matter of fact a window with a circassian walnut background drew twice as many persons as it did when the background was painted a flat white notwithstanding the fact that the brightness in the latter case was about twenty times greater than in the former case.

The data from experiments with different backgrounds are not extensive enough to warrant the

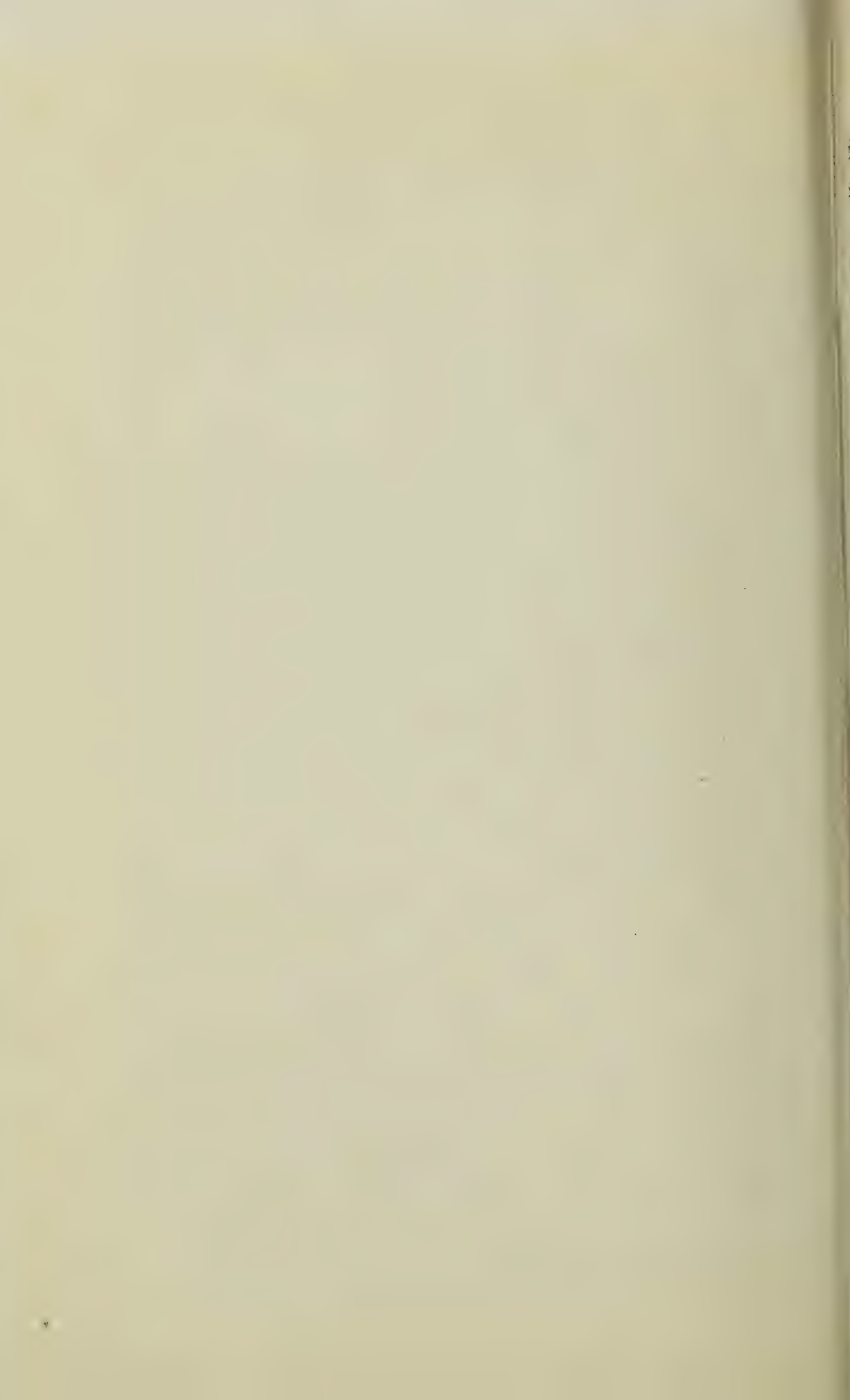
conclusion that the darker the background the greater the drawing power; however, they do indicate at least that there is no inherent advantage in a bright background and that apparently there may be some advantage in the darker backgrounds. At any rate the tests suggest that the merchandise displayed is the predominant drawing force of the show-window. Certainly most merchandise stands out more clearly against a moderately dark or medium gray background than against a very bright one. Satisfactory seeing is largely a matter of a proper contrast. In general, merchandise is darker than white backgrounds and the ability to see and the satisfactoriness of viewing merchandise against a bright background are generally less than when the backgrounds are darker than the merchandise. The texture and color of very dark merchandise cannot be easily distinguished against the glare of a bright background. Furthermore, it should be an axiom of the art of display to show the article, as a general rule, brighter than the background. Of course, backgrounds of high reflection-factor conserve light to some extent and reflect it into the shadows. In fact, they do this to such an extent that the great value of modelling objects by highlights and shadows is to some extent lost. In other words, too much diffused light tends to render objects more or less expressionless excepting for the dif-



(Courtesy of F. Schumacher and Co., through J. Walter Thompson Co.)

PLATE XXIV

Color aids greatly in depicting the beauty of design in this silk brocade which is representative of the transition between the art of Louis XIV and Louis XV periods.



ferences in color; that is, the power of light and shade is greatly reduced.

Most backgrounds are conventionalized interiors; that is, they consist of panels of more or less ornamental treatment. Those that are stained as is quite often the case are dignified but have some disadvantages. They are polished and are "fixed" as to decorative scheme. Paints have greater potentiality than stains and the dull surfaces which can be readily obtained are quite satisfactory. Maintenance is more costly but the fact that the surfaces can be easily renewed, makes paint desirable. A more decorative treatment is generally fitting and possible with painted backgrounds.

Scenic backgrounds are very effective in creating setting but often some of the advantage of these is lost by not providing special lighting for them. Combinations of scenic backgrounds and special lighting effects are powerfully suggestive of approaching events and seasons. They can do much toward making merchandise attractive before the actual season of use begins. These are discussed further in connection with displays, but at this point let us consider a show-window with a complete lighting equipment for utilizing as much as possible of the potentiality of light as an expressive medium.

In a preceding paragraph foot-lights, upper

border-lights, spotlights and colored accessories were mentioned. Let us assume these are already available. The background is a conventionalized interior but let us provide a decorative casement window in it. Beyond this window at a distance of two to four feet, depending upon the size of the window, let us provide another background which is illuminated by means of lighting equipment concealed above and below the window behind the first (interior) background. This makes it possible to place painted scenes on the second background to be seen through the window in the first background. By proper lighting equipment cold light, warm tints, etc., can help to suggest daylight, sunset, moonlight, autumn, winter, etc. Here we have the expressiveness of light utilized to the full extent.

Let us discuss an actual display in which this window and the second background are used. Furs, for example, are displayed late in summer when the weather does not emphasize their necessity. Here the powerful suggestive and seductive psychological influence of lighting can be applied effectively. The show-window is furnished as a room in a home and lighted with warm yellow light, with an additional floor-lamp and two wall-brackets. The light in this interior should be of a warm tint, such as obtained from a mixture of red, yellow and colorless lights. The flametint

lamps are suitable for this interior. A figure of a woman stands apparently gazing out of the window at the background which is a wintry landscape. The latter is illuminated with a light of a cold blue-green tint. The observer's gaze naturally follows that of the figure and the influence of the winter landscape is felt. The figure of the woman may be cloaked with fur. Muff, stole, gloves, etc., may lie carelessly on articles of furniture, and fur rugs may be on the floor. Lighting is the dominant force of the scene. The warm glow of the interior is contrasted with the cold wintry scene and by suggestion such a setting should awaken interest in furs in August. Light can do much to stimulate the dormant imagination and to suggest a coming event or season.

These are mere glimpses of lighting possibilities. In general the show-window has been used as a place merely to display merchandise, and therefore the lighting equipment has been of the simplest form. Those who know what light can do realize that with modern equipment the possibilities have been barely touched. Modern show-windows should have more lighting equipment so that the requirement of any display may be met.

THE APPEARANCE OF MERCHANDISE

When the object of a display is merely to show merchandise in its true colors, the modern tungsten daylight lamps are eminently satisfactory if a sufficient intensity of illumination is provided. The windows in which these lamps are used are also distinctive amid the adjacent windows, street-lighting units, and other places where ordinary tungsten lamps are used. By using daylight lamps and ordinary lamps alternately from week to week a degree of variety can be obtained.

The introduction of colored light into show-windows brings forth the serious problem of the appearance of merchandise and in many cases where colored light has been used without consideration of this point the result has been a failure. For example, a flood of amber light upon men's furnishings may attract many persons because of the striking difference in color. However, there may then be a reaction of dissatisfaction, consciously, because the actual colors of merchandise can only be guessed at. Colored light should be used only when the primary aim is not to display merchandise in its true colors. It is a great ally in providing atmosphere, in enhancing a setting, and in aiming solely for attractiveness. A spot-light of unmodified light avoids some difficulties with a flood of colored light.

Although various details of the use of colored light are discussed in a subsequent chapter, some influences of colored light upon the appearance of colored objects are presented in Table XI. These are only approximations because the appearance will vary somewhat with colors of the same appearance under daylight. See Plate VII.

TABLE XI. THE EFFECT OF COLORED LIGHT ON THE APPEARANCE OF COLORED OBJECTS.

<i>Natural Color of Object</i>	<i>Color of Light Illuminating the Object</i>					
	<i>Red</i>	<i>Orange</i>	<i>Yellow</i>	<i>Green</i>	<i>Blue</i>	<i>Violet</i>
Black	Red black	Orange black	Yellow black	Green black	Blue black	Violet black
White	Red	Orange	Yellow	Green	Blue	Violet
Gray	Red shade	Orange shade	Yellow shade	Green shade	Blue shade	Violet shade
Red	Red	Scarlet	Orange	Brown	Purplish black	Reddish purple
Orange	Red	Orange	Yellow orange	Greenish yellow	Black	Black
Yellow	Orange red	Yellow orange	Yellow	Yellowish green	Greenish black	Black
Light green	Red shade	Yellow green	Greenish yellow	Green	Blue green	Bluish shade
Deep green	Black	Greenish black	Yellowish green	Green	Greenish blue	Blue black
Light blue	Violet	Dark gray	Yellowish shade	Blue green	Blue	Violet
Deep blue	Purple	Blue gray	Gray	Blue green	Blue	Blue violet
Violet	Reddish black	Red purple	Gray	Blue	Violet blue	Violet
Purple	Red shade	Red shade	Red shade	Black	Blue	Violet
Rose	Red tint	Red tint	Red tint	Greenish black	Blue shade	Violet shade

The easiest way of determining the effect of a colored light on a certain colored object is to try the experiment and note the result. It is not always possible to predict the change by a mere observation of the colored object because the science of color is based upon the spectrum. The eye synthesizes colors; it does not analyze them into their spectral components. However it is usually not difficult to predict approximately through some knowledge of color science. By judging the spectral colors which an object will reflect and then judging the spectral colors in the illuminant, the final appearance can be approximately predicted. This final appearance will be the resultant sensation of the spectral colors common to the object and to the illuminant. This will be recognized as the subtractive method of color mixture already discussed. The appearance of a colored object under colored light is somewhat complicated by certain surface phenomena but for most practical purposes the foregoing table will give a sufficiently correct idea of the influences of colored light.

A colored object illuminated by light complementary in color will appear black or a very dark gray with perhaps a slight residual color of the illuminant due to a surface effect. In the other cases the tendency of the color of the object is to shift toward the color of the illuminant. It is

often said that red light brings out red colors; green brings out green colors; and so on. This is true but it cannot be depended upon too far. For example, a ribbon of a red tint stretched across a light gray background may become entirely indistinguishable when both are illuminated by a red light. The same is true of other colors. When this is done with care wonderful disappearing and changing effects can be produced. Many years ago the author¹ developed many effects of this kind.

Thus it is seen that red light can submerge red colors, and so on. The reason is, for example, that the flat ribbon and its flat background can be of just the correct color and value so that under a certain colored illuminant no contrast either in hue or in brightness remains. As a result it can not be distinguished from its background. The principle can be applied so that two or more different scenes can be painted on one surface and each can be brought out alone by a proper colored light.

THE DESIGN OF LIGHTING

No detailed discussion of lighting equipment will be presented here because the engineering features do not fall within the scope of this volume. Furthermore, without laborious study of tedious

¹ Color and Its Applications, by M. Luckiesh, 1915, 1921, Chap. XII.

detail the merchant or display-man could not hope to become expert enough to design the lighting equipment. There are now many types of reflectors, troughs, color-filters, spotlights, etc., available and manufacturers are glad to supply the merchant or architect with the technical data. Many of the lighting units used in homes, especially portable lamps, have places in some window settings.

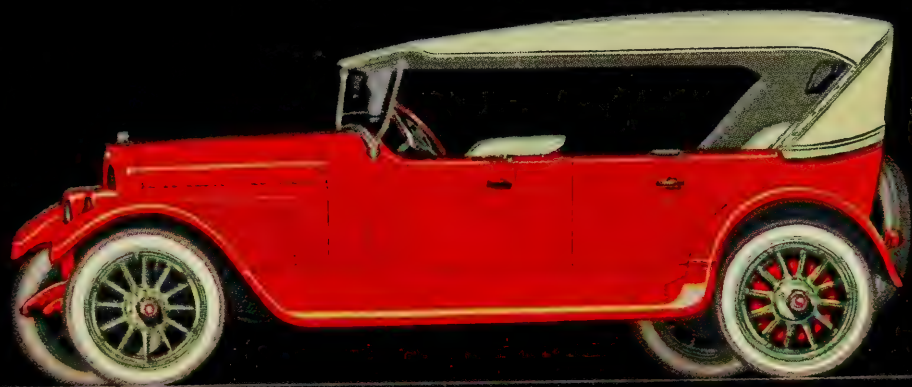
Daylighting is at best unsatisfactory. Prism glass and ceiling skylights have been tried in show-windows with indifferent success at best. The safest plan is to depend upon the daylight entering the window. One of the ever-present nuisances in the daytime is the images of the sidewalk, street, buildings, etc., reflected from the surfaces of the glass. Many attempts have been made to eliminate these but there are only two ways, one of which is obviously impracticable. The first would be to paint all objects outdoors whose images are seen in the glass, a dull jet black or better still to cover them with black velvet. The other is to illuminate the show-window so highly that the reflected images are overpowered by the brilliant display. Some recent work¹ indicates that this is practicable. In this case light-colored backgrounds are more satisfactory because they

¹ Overcoming Daylight Reflections in Show-windows, W. Harrison and H. T. Spaulding. Trans. I. E. S. 17, 1922, p. 677.

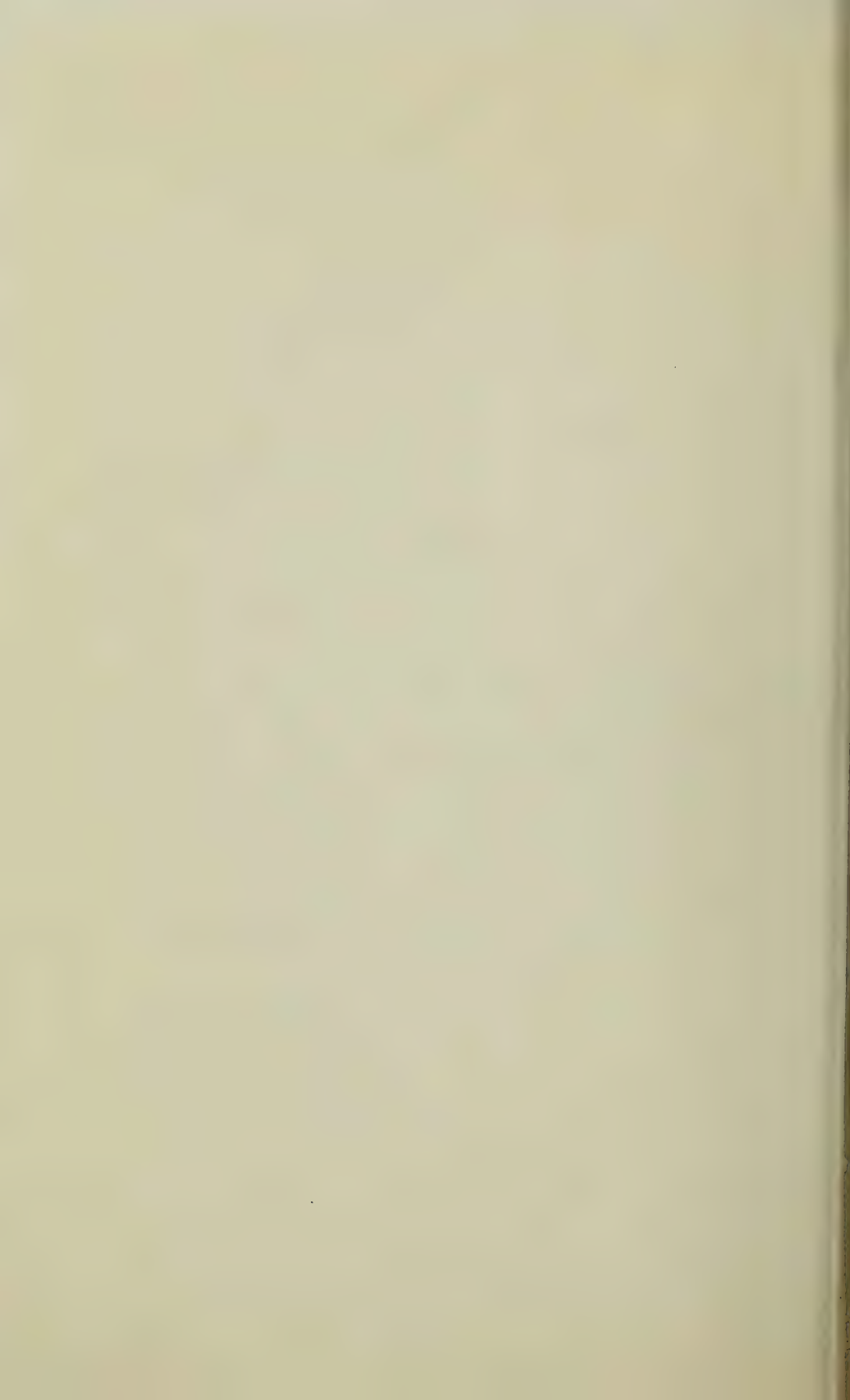
PLATE XXV

Black has great potentiality. Here it is novel, dignified and effective as a background for color.

*(Courtesy Nordyke and
Marmon Co.)*



Seven-passenger Phaeton



present less contrast with the reflected images. On bright sunny days the intensity required to overpower these images is very great. Perhaps some day the surface reflection of glass may be appreciably reduced. This would be the most desirable solution. Incidentally, toward evening when artificial light in the windows is mixing with the waning daylight, the so-called daylight lamps are particularly satisfactory.

A consideration of the lighting equipment of the show-window should involve, —

1. Intensity of illumination for various displays
2. Lighting equipment which will provide a variety of distributions of light
3. Equipment for utilizing colored light
4. Proper concealment of lighting equipment
5. Window background including scenic and secondary backgrounds and window openings in the primary backgrounds
6. The character and variety of displays
7. Reflected images from background and from the plate glass

CHAPTER XI

DISPLAYS

IT IS not the aim in this chapter to treat displays in great detail for their variations are as extensive as the combinations of merchandise, setting, lighting, and ingenuity and taste of the display artist. In the preceding chapter certain factors of lighting and setting were discussed. In the present one these are extended and some of the deeper phases of modern possibilities are touched upon. The discussions presented herewith are drawn from intimate studies of light, color, lighting and vision based upon many experiments. The discussions presented in many of the preceding chapters are applicable to displays, for after all the display is, to a degree at least, a realistic advertisement.

Certainly the modern display-man should not consider his show-windows places for merely displaying merchandise lighted in a perfunctory manner. Modern lighting has introduced many possibilities which should not be passed by unused. All the expressiveness, impressiveness, and symbolism, in fact, all the possibilities of the

psychology of light and color are available at the present time to the display-man through the aid of modern lighting equipment. With primary light and actual merchandise he has a great advantage over the advertising specialist who must express himself pictorially and with the aid of the interior medium of secondary light from printing inks and paints. If the display-man wishes to see some of the possibilities of lighting let him study how light models and paints objects.¹

Light is a master sculptor and a master painter. The position of the dominant light-source determines the direction of the shadows. The size of the light-source, or rather, the solid angle subtended by it, determines the character of the shadows. The amount of scattered light determines the brightness of the shadows. These are the effects of light and shade and they may be harsh, striking, soft or subdued as desired by controlling the causes. The quality or color of light determines the appearance of all the colors of the merchandise and setting, including the whites and grays. The display-man can do nothing more instructive to himself than to experiment in his workshop on a small scale with the modelling and painting of objects by means of light. Such experiments, combined with knowledge gleaned in

¹ Light And Shade And Their Applications, M. Luckiesh, 1916; Color and Its Applications, M. Luckiesh, 1915, 1921.

the byways represented by various preceding chapters, will do much toward helping to introduce or to increase the effectiveness of light and color into his show-windows. Furthermore, his displays will have distinctiveness, appeal, character, and attention-value superior to those which are based upon the old traditions. He will become as distinctly superior to his fellow craftsmen as stage-directors, who have grasped the potentiality of light and color, have eclipsed their contemporaries.

There appears to be no more fruitful viewpoint than that of the stage in considering the window-display but this viewpoint should be ballasted by the fundamentals of advertising. The light and color effects on the stage are designed chiefly to please and seldom are the deeper meanings utilized. The display should not only please but should reveal something of the quality of the merchandise and of the store. It should not only display goods but it should be suggestive. It should not only be attractive but it should create desire.

Generally it is obvious that the object of the display is to show merchandise and the lower the class of store the more articles are found in the display. As the quality of the store increases the number of articles decreases. Certainly singleness of effect should be the goal of a display. This is approached when only articles of the same kind

are displayed in a window. These may be hats, waists, china, or what-not but for the greatest effectiveness to obtain, the articles should be of the same family. A still closer approach to singleness of effect and to a suggestion of high quality is obtained when there is still greater concentration of attention. For example, a central object of large size and greater distinction may be surrounded by minor objects of the same family. Here the spot-light aids in centering attention. A further step in this concentration or singleness of effect is obtained by using a single object of merchandise amid purely decorative furnishings and setting. This single object may be spot-lighted while the rest of the display is illuminated with a low intensity of modified light or even with a "fog" of colored light. The final step in this progression toward concentration is to surround the object with very dark draperies or even black velvet. When spot-lighted it now stands out boldly and commands attention.

On the stage we do not have merely a flood of unmodified light. Many devices for controlling the distribution and color of light are pressed into use to supply atmosphere, to aid in enhancing the setting, to emphasize the principle character of the moment, and to express a mood or an occasion. Thus as the play progresses the lighting shifts appropriately, keeping pace with the action and

changing with the mood. So it should be in the show-window. Here we should have variety not only for the sake of novelty from week to week, but also for the sake of the merchandise. Season, occasion, quality and use are factors which can be suggested or emphasized by lighting. In fact, lighting is the most effective medium for obtaining variety in the display-window. Light is more powerful than pigments or other media which depend upon reflected light and it is a vastly more mobile medium than those represented by paints, dyes, fabrics, etc. By having sufficient equipment and two or more circuits, the display-man is really able not only to adjust the intensity of illumination and distribution of light to suit the needs of the display but is also able to utilize the powers of spot-lights and colored light. The location of the merchandise and the general arrangement of the setting should be determined by the lighting equipment available and the dimensions of the window. For example, in a shallow window without foot-lights the trim should be as far back as possible. This is not as serious in a deeper window because the trim is naturally placed further back.

COLORED LIGHT

Satisfactory equipment is now available for obtaining colored light in show-windows and this equipment can be installed where there is space

for reflectors. In some cases it may be necessary to increase the size of the wire in the electric circuits in order to provide additional wattage of lamps. The ideal should be about five circuits so that there is one for each red, yellow, green, blue, and unmodified light. It is then possible to obtain a variety of lighting effects without changing the color-filters. The installation of five circuits presents great difficulties excepting in rare cases. A compromise can be adopted by installing as many circuits as conveniently possible. However, if only one circuit is available the display-man can still utilize the expressiveness of colored light, for he can install the proper reflectors and use the color-filters desired. These filters can be changed each time to suit the requirements of the display. In the preceding chapter the mixture of colored lights and the effect of colored light on the appearance of merchandise have been discussed.

A company operating thirteen chain stores utilizes interior lighting as an advertising medium, the cost being covered by their advertising appropriation. In eight stores the entire ground floor — the very highest-rent space — is used for window-display purposes. In one case artificial lighting was used from 7 A.M. until after midnight with such effective results that the procedure is being extended to other stores. The management has stated that “without our attractive, well-

lighted window-displays our newspaper advertising would not be nearly so effective. At times it may be necessary to cut down our newspaper advertising but we never skimp on our lighting." This company uses colored light in their show-windows to some extent. Some of their window-displays are on the second floor facing the street. This is an excellent place for colored light because there is no opportunity for the observer to get close enough to examine the color or texture of the goods. Here the decorative effect as a whole is important. This group of displays lighted with moderate tints of amber, rose, etc., are attention-compelling owing to their high position, their number, and their distinctiveness of color. This is an excellent condition under which to use floods of tinted light in the show-window.

The modern equipment for obtaining colored light has naturally brought about some attempts to use it. Generally these attempts have been rather unsatisfactory and obviously based upon a very superficial knowledge of the power and appropriateness of color. Colored light should be used generally for *itself* — for its appeal, its expressiveness and its impressiveness. Excepting in the lightest tints colored light can do little toward directly enhancing the appearance of merchandise. When merchandise is flooded with colored light the articles do not appear in their true colors.



(Courtesy of American Writing Paper Company)

PLATE XXVI.

Color in a trademark superposes all of its many powers upon what would otherwise be merely outline form. Certainly the use of color has been amply justified for trademarks, wrappers, packages, etc.



In fact, it is difficult to judge what the true colors are. It is legitimate to use very light tints of warm and cold colors if they are appropriate, for the appearance of the merchandise is not varied over a greater range than when changing from daylight to ordinary artificial light.

Some other way must be found to use the power and attractiveness of colored light than by flooding the merchandise with it when the appearance of the merchandise is of prime importance. For example, a display of men's shirts was illuminated by means of amber light. This display flooded with this unusual light attracted great attention amid the neighboring windows in which unmodified light was used. Many persons stopped at the amber window but they could gain no clear idea of the colors of the fabrics of the shirts. They were confused at best and perhaps annoyed. Doubtless the particular store was brought to the attention of many prospective customers. Perhaps from this standpoint the colored lighting was worth while but the window-display sold no merchandise by virtue of the actual appearance of the merchandise. Many such cases have been found during the present early stage of the introduction of colored light. Doubtless an occasional use of colored light in this manner is worth while from the standpoint of attention-value but other ways must be found for using the powers of

colored light in the show-window if the merchant is to utilize these powers effectively and more or less continuously.

There is a great deal of merchandise which is not bought or sold chiefly on the basis of its color. Pianos and other musical instruments, hardware, many kinds of sporting goods, some glassware, most optical supplies, many electrical appliances, and fire extinguishers are among the articles which do not appeal chiefly by virtue of their color. In these cases the attention-value of colored light combined with proper settings can be utilized without much difficulty or without finding special ways of utilizing the colored light.

In the use of colored light we should be guided by a broad viewpoint and an adequate knowledge of the psychology of color. The many attributes, symbolisms, accepted usages, associations, and other characteristics of color are tools for the display-man as well as the advertising specialist and the stage-director. Colors speak a language, intricate but understandable. They express themselves. They impress us. They command attention. There are as numberless combinations and applications of colors as there are of the elements of any spoken language. In learning this language of color it is a safe plan to use colored light sparingly. Tints are safer than pure colors, the latter being for the more

powerful or more spectacular effects. The laws of color harmony are useful but appropriateness is a vital factor in the show-window. It is well to be studious and careful but it is also desirable on occasions to be daring. We are all savages in our love of color for color's sake or of color with which we live momentarily. The show-window is a momentary thing in the observers' lives, so it is well for the display-man to remember that he is to some degree playing momentarily to, let us say, somewhat unrestrained tastes which for the moment will exult in colorfulness which they could not live with continually. This is an age of color but its use must be directed by refined taste and a knowledge of its language.

THE SPOT-LIGHT

In those cases where the appeal of merchandise is due largely to its appearance in true colors, the spot-light can reveal the important objects by means of unmodified light even though the entire display is flooded with colored light. The shadows remain colored while the highlights are not colored. This gives an attractive effect in addition to the surrounding "fog" of color or of an enveloping colored shadow. A number of small spot-lights can be used with excellent effect if several objects are of major importance. We

can all recall the power of such effects on the stage. Instead of a flood of colored light over the entire display, the colored filters may be predominantly placed near the ends of the window. With uncolored light in the central region, there is the grading off to the dimmer but deeper hues. Such lighting is suitable, for example, for figures in women's evening dresses grouped near the center with warm yellow or rose tints hemming in the brilliantly illuminated figures. For a successful use of the spot-light the display should be simplified from the standpoint of the number of articles of merchandise; that is, the singleness of effect should be striven for as discussed in early paragraphs of this chapter. See Plate X.

Some striking effects can be obtained by automatic "flashers." One of the simplest effects is obtained by attaching a single make-and-break device in the circuit of the spot-light. When this circuit is broken the whole window remains in a flood of tinted light. When this circuit is again completed the object on which the spot-light is directed becomes brilliantly illuminated. When it brightens up suddenly it appears to move forward or to enlarge. The effect is striking and attention-compelling and can be produced in an artistic manner. If draperies of dark velvet can be placed back of the spot-lighted object so as

to appear harmonious they will do much toward enhancing the beauty and mystery of the effect by obliterating by absorption the spilled light from the spot-light. Two spot-lights, one from each side and alternately operated, produce striking effects on many objects, such as sculptured figures, etc. The changes in expression are quite beyond the expectations of those who have not seen them. Thus spot-lights not only solve the colored-light problem in many cases but by flashing them on and off rather slowly they introduce very striking effects.

This combination of color-lighting and spot-lighting is a relatively new use of lighting as a sales aid. It introduces something in displays that is welcomed for its attractiveness. It brings color and light into play upon the observers' emotions in a manner much more powerful than the merchandiser has been able to achieve without it. In choosing the colored light it is well to consider the earlier chapters which deal with characteristics, preferences, emotional-value, and symbolism of color. These will help toward a wise choice.

Assuming that spot-lights of unmodified light are used to properly reveal the merchandise to the observer, we may readily choose a colored light for the atmospheric effect. Red would not only be appropriate for displays of fire-arms, fire-

extinguishers, fire-proof material, but for many other settings, such as flowers, china, and statuary. Rose might be considered for the more delicate articles associated with women such as lingerie, toilet articles, hats, dress-goods and evening dresses. Orange is not only the symbol of heat, and therefore appropriate for heating devices, but it is a color of autumn, of Hallowe'en, and appropriate to fall merchandise. Warm yellow suggests sunshine and the comfort and cheerfulness of the fireside. It could be used for displays of interior furnishings, summer goods, leather articles, and many kinds of apparel. Green is cool and refreshing and suggestive of outdoors, of life, vigor, and youth. It is appropriate for displays of sporting goods, bathing suits, vacation supplies, and even for articles for rainy weather. Blue is serene and even cold. It emphasizes whiteness in china. It may be used for glassware, silverware, diamonds, refrigerators, fans, enamel ware, and for cool clothing. Purple light obtained by mixing red and blue is a rich royal color suitable for emphasizing the majesty of dignity, quality, and splendor. White light is obtained by adding blue-green light to unmodified artificial light or by using tungsten daylight lamps. It suggests purity and cleanliness and has many uses besides revealing colors with fidelity. These are only a few examples. As al-

ready stated, in the early chapters are discussions of the attributes of color which are extensive enough to aid the display-man in choosing colored lights for his specific cases.

Contrast is the life of color, and a general colored lighting can be emphasized by a minor contrasting light just as the color of a yellow gown may be enlivened by a bit of blue trimming. Adjacent windows are always contrasting factors in color-lighting.

OTHER EFFECTS

Colored shadows are easily produced by illuminating objects from two directions with two different colored lights respectively. The effect is seen by casting upon a white surface two shadows of the hand or other object by means of two light-sources differing in color. In a show-window this striking effect can be obtained by confining one set of color-filters to one side and another to the other side. The resulting colored shadows are quite attractive, particularly on white or light-colored articles. With this effect can be combined that of the spot-light or of one or more lighting units without filters in the center of the window.

A beautiful effect may be obtained in a large window amid a setting of furniture or of similar interior furnishings. This is particularly applica-

ble where the merchandise does not demand a true revelation of its color. Suppose a high-class piano or phonograph is to be displayed. The setting may be an interior arranged as a decorative painting. Place a rose lamp in a portable floor-lamp; a blue filter at the lower right; one or two red ones at the upper left; and a yellow one somewhere else. Flood the scene with the right amount of a delicate tint of rose or yellow. The effect can best be described as similar to changeable silk. The reflected high-lights from the polished furniture, the subdued colored shadows, and the almost submerged shadows cast in different directions produce a mysterious elusive effect. Such a setting can be enhanced by a fancifully painted or dyed fabric background. The whole effect is similar to a decorative painting and can be wonderfully attractive notwithstanding the simplicity of the lighting equipment.

The charming effect of colored multiple shadows can be easily obtained by using lattice and flowering vines for casting the shadows. If light-sources of two or three colors in different positions are placed above this lattice, the shadows cast upon the remainder of the setting are of different colors. Some wonderful effects are obtained by this simple means.

Instead of using the spot-light unmodified in color and the whole display flooded with colored



PLATE XXVII

The lighting combined with the "crystals," "snowballs," and other decorative features produced a powerful effect of "coolness" in the Alexandria hotel in Los Angeles.



PLATE XXVIII

Modern incandescent lamps may be safely concealed in fixtures, behind cornices, and elsewhere so that lighting and architecture can be harmonized. A great variety of lighting effects are obtainable.

light, the reverse procedure is sometimes effective. In other words, the display may be flooded with white or slightly tinted light. The spot-light may be of a pronounced tint different from that of the general lighting. Thus this colored spot can be directed upon white objects with charming effect. The spot-light can be flashed on and off if desired.

If the show-window is adequately equipped with foot-lights, spot-lights, and overhead units with colored filters, combinations of these can be used with striking effect. For example, powerful unmodified light may be directed upward from the foot-lights and the whole flooded with tinted light from the upper units. This leaves high-lights uncolored and the shadows colored. The unnaturalness of the predominant upward light can be employed in some cases with telling effect. The reverse of this scheme has some novel possibilities. There are numberless combinations of foot-lights, spot-lights, upper border-lights and color filters.

A predominant light from one direction¹ is always powerful in effect. For example, several units emitting white light may be confined to one end of the window. The display-man may be content to use only these and to obtain the effectiveness of the deep oblique shadows or he may use colored light in the remaining units.

Backgrounds are discussed in the previous

¹ Light and Shade and Their Applications, M. Luckiesh, 1916.

chapter. Many novel lighting effects are made applicable to the show-window by means of scenic backgrounds specially lighted. The second background was discussed at some length. By means of it certain lighting effects can be confined strictly to it, thereby greatly increasing the uses of light. The background with the aid of lighting can suggest coming events and seasons, and various uses and properties of merchandise. The example of a display of furs discussed in the previous chapter is representative of the possibilities of scenic backgrounds and particularly of the possibilities of the second background seen through a window in the first background.

If the first background is a scenic one some excellent effects can be obtained by lighting it by means of lighting units concealed from the observer by the merchandise or other objects. Of course this background is also usually receiving some of the light which is directed upon the merchandise, so that its special lighting from sources concealed by the merchandise is somewhat diluted. This emphasizes the advantage of a secondary background to be viewed through an opening in the primary background.

If one wishes to go in for automatic flashers or motor-driven contactors he may avail himself of the possibilities of mobile light and color. There are small thermostatic flashers which will take

care of considerable wattage but for large circuits the motor-driven flashers are necessary. The sequence of events may be just as complicated or extensive as the lighting circuits permit or as the display-man desires. Sometimes it is unnecessary to make or break the circuit which supplies the colored lighting. A simple case is the alternation of white and colored light. Instead of the flood of white light one or more spot-lights may be used. In this case owing to the much greater quantity of white light than of colored light, the latter may be in operation all the time. It will be overwhelmed by the white light. A more complicated case is to have white and two colored lights. For example the sequence may be white, red, red and green (yellow), green, white, etc. The red and green may overlap for a period producing yellow by mixture. Such effects are spectacular and must be used carefully and perhaps rarely.

A more satisfactory method of producing these sequences is to use motor-driven rheostats. By dimming one circuit and brightening another the effects blend into each other without jar. If this is done slowly the effect can be very charming. Most of the equipment is available for mobile-light effects excepting the blending rheostats which are motor-driven. These can be made without difficulty.¹ There are many accessories, such

¹ The Lighting Art, 1917, M. Luckiesh.

as illuminated fountains, which can be utilized in some displays to advantage. Although mobile-lighting effects are more costly and intricate than fixed ones, they are bound to be used to some extent eventually. A display is a cross-sectional view of the flow of merchandising. It is static or fixed but lighting can do much to make it dynamic or to give it apparent life. The fixed display with sameness in lighting from week to week is analogous to a sustained chord in music or to a painting. Successions of effects, whether momentarily by mobile lighting or weekly by different lightings, comprise the symphony of expression in the art of display. In the direction of lighting with its endless variety, the display-artist will find novelty and extended artistic possibilities. Let him penetrate the psychological depths of light and color and also keep his eye turned to the stage where box-office receipts are influenced by novelty and striking effects. Just as stage-lighting helps the "tired business man" to relax, so can display-lighting do something toward relaxing the ever-strained condition of the average purse.

Sometimes the display-artist may forget merchandise or make it a minor motif. When he has decided to do this he may design the setting and lighting for pure beauty. Surely any creative artist is entitled to these periods of play with beauty, color, and setting. Some quality stores

have seen fit to permit this occasionally. The public enjoys the occasional privilege of feasting upon these rare visual treats.

Color can be utilized as an insignia when it is not prominent in the merchandise itself. For example, certain stores selling men's hats have adopted materials such as tissue paper, ribbons and silk draperies in addition to the hats for their window trims. These are changed simultaneously throughout the country from week to week. The more appropriate colors, such as pink, blue, lavender, and blue-green, have been used for this purpose. Employed in this manner color becomes distinctive and its use is systematic. It becomes a finger-print for this chain and a certain value is accumulated and perpetuated. The public forms the habit of looking for the next color. Such a display does not merely go out of existence when replaced by another, for it connects not only one store with another of the chain, but its influence becomes accumulative in the same store. Men's hats are not colorful, so the decorative and distinctive qualities of color are obtained by means of the ribbons, tissue paper, silks, etc. Thus this window is not merely another window displaying men's hats.

CHAPTER XII

STORES

THE preceding chapters constitute the portion of the chain of merchandising from advertising to the show-window and display, until in this chapter we reach the actual selling. In all these links of the chain it has been the aim to treat light and color as selling forces. Many of the analyses of color in the earlier chapters are applicable to the subsequent chapters including the interior of the store or shop. It has been the aim in these subsequent chapters to avoid repetition of the discussions, leaving it to the reader to apply the material to the various links of the chain and to add new discussions specifically of interest to the subject at hand. Just as color is important in the advertising and in the merchandise, it is also important in the environment of actual merchandising. Just as lighting is the life of displays, so is it a powerful element as a sales aid in stores. It is not the aim to go into the matter of interior decoration in detail but rather merely to touch upon this as one element in the ensemble which may be termed the personality

of the store. Furthermore, it is the aim to give attention to those elements which have not been so widely sponsored.

It has been known for some time that merchants, who have rehabilitated their lighting equipment so as to have proper and adequate lighting befitting the recent developments in light production and utilization, have noted an increase in sales and general satisfaction. A recent extensive survey of opinions has shown that the feeling is quite general among merchants, who have had experience with modern adequate lighting, that it is a powerful sales force. From the large number of expressions of merchants in regard to the value of lighting as a sales force, a few representative ones are briefly abstracted in the following paragraphs. Of course, many factors are involved in merchandising and the effect of lighting is difficult to isolate; however, many merchants are so convinced of its value that they make very positive statements.

The store of a company supplying printing, engraving, and stationery was moved from a "central" location to one a few blocks distant. The company expected a decrease in business for some months but this did not occur. In fact the business increased. The store is very well illuminated so that merchandise could be selected with ease even in the remote portions of the sales-room,

and is one of the most attractive features of the present locality. The company places a "very high advertising value and merchandising value" upon their "fine lighting system" and believe it was largely responsible for the sharp increase in business incidental to moving from an established location.

A large store dealing in women's apparel increased the intensity of illumination about 70 percent. The "efficiency of the salesladies was noticeably increased" and the stimulative effect of better lighting was very apparent. This company considers "good lighting and salesmanship to be the two most important features" in their merchandising. The artificial lighting is used all day, it is systematically maintained, and is "given special attention before each special sale."

A store handling men's clothes brought its artificial lighting up to modern standards. The management wanted "as bright and as attractive a lighting effect as possible because it sells merchandise a whole lot easier and it makes the customer feel better." They further state that "the business increased 50 percent in a few months" and that they "lay this increase to the good lighting as much as to anything else." They use the artificial lighting all day and operate their windows until midnight.

A company selling music and musical instru-

ments improved their lighting system with the result that "business has greatly increased since making the improvement." "Customers often remark about the splendid effect which the increased lighting system gives." They "cannot recall any recent expenditure that has given anywhere near a like return for the investment."

A store selling mens' furnishings changed their lighting fixtures to modern ones, doubling the intensity of illumination, "and have proven that it was the best investment in the way of increasing business ever made" by them. They state that they "have been ardent advertisers but decided that it did not pay with an incomplete lighting system" which they had. They believe "that a well lighted store does more to increase their business than an extensive advertising campaign." They keep their "windows lighted all day and find it pays for itself many fold."

A chain-store company selling high-grade men's furnishings states that "there was a time when a corner site was considered requisite if a clothing store were to have the proper light throughout the interior. Today, thanks to the artificial daylight lamps they are often satisfied to take the middle of the block." They believe that they "have proven the economy of modern illumination, its saving of time and reduction of overhead."

A large store selling women's wearing apparel

uses artificial light effectively in the store and windows. The management points out the value of artificial lighting by recalling "that during the war, when lighting was restricted to certain hours of the day, a distinct drop in the sales was the result." In his store, due to structural conditions, "one section is always better illuminated than the other and the former is always busier than the latter."

A very large clothing store recently doubled the intensity of illumination and installed tungsten daylight lamps in the store and display windows. The management states that "it not only helps sales but greatly cuts down returned goods. It also adds to the feeling of contentment and satisfaction of our employees, which is reflected in added courtesy to the public."

Many merchandisers refer to days when artificial lighting is reduced or even unavailable for some unavoidable reason as being days of very poor and unsatisfactory business. These extreme cases at least reinforce the many favorable experiences attending improvements in inadequate lighting systems.

In a flower shop a new conservatory was built in connection with the sales-room. For several months the management could not detect any sales results from it and after a study of it he concluded that the lighting was faulty and inade-

quate. Consequently the lighting was improved and "the sales increased five times in the next month and continued to increase thereafter." The company also places great stress upon its window lighting and in general believes that "lighting is a medium of advertising and selling that no one can afford to overlook." See Plate X.

INTENSITY OF ILLUMINATION

It has been proved that the drawing-force of a show-window increases with intensity of illumination and if increased drawing-force means greater sales then lighting has been proved to be a sales force. No extensive data in actual figures are available for the lighting of stores but many progressive merchants believe that lighting is a very important factor, that adequate and proper lighting is excellent advertising, that it means more sales, and that it helps to make satisfied customers. Many merchants believe that adequate and proper lighting is more productive of efficiency, good will, sales and satisfied customers, per dollar expended, than any other factor of actual merchandising. A very large department store made a careful study of the movement of merchandise in relation to the intensity of illumination. They found that slow-moving goods were sold much faster when moved to a part of the store where

the intensity was several times that over the store in general. It was concluded that there was a psychological effect upon the salesmen and saleswomen and also upon the customers, which resulted in greater sales besides the increase due to added attention-value of the goods.

It has been proved in the industries that production increases with increased intensity of illumination due not only to the better conditions for seeing, but also to the stimulative effect of light. In a similar manner salesmen are stimulated to greater activity and goods can be found and examined quicker, with a resultant greater satisfaction to the customer. Proper and adequate lighting improves the *esprit de corps* of the sales force, and salesmen and saleswomen have been observed to improve their personal appearance when the lighting standards were raised. Poor lighting encourages slovenliness in many ways. It is responsible for much physical discomfort and disability. Two stores selling the same class of merchandise were in other ways quite similar. One was well lighted, the other was not. Four times as many clerks in the latter store were excused for headaches and minor disabilities as in the better lighted store.

In discussing intensity of illumination it is well to consider that daylight intensities outdoors — under which the eyes have envolved — are enor-

mously greater than intensities of artificial light which we have used in the past owing chiefly to practical and economic considerations. The intensity of daylight outdoors on a clear June day is as high as 10,000 foot-candles and we call it a gloomy day when the intensity falls to 1,000 foot-candles. Still, indoors we have been accustomed to only a few foot-candles of artificial light. Until recently we had only feeble flames for light-sources and by necessity were forced to be satisfied with a few foot-candles. But today artificial light costs only one fiftieth as much as it did a century ago. It has decreased in relative cost even more as shown by considering the lowered purchasing power of a dollar and the increased standard of living. Therefore we could use several hundred times more artificial light today than a century ago and still maintain the same economic balance. But instead of doing this we are using low intensities which from physiological and psychological considerations are too low to be conducive of the best physical comfort, efficiency and productiveness of ourselves and our employees. In the better lighted stores today we find intensities of artificial light from four to ten foot-candles but in most of them the average is much lower.

Not only should the lighting be proper and adequate from the standpoint of attractiveness and

of the efficiency and comfort of employees but the customers have a right to be able to examine merchandise satisfactorily. A test of intensity of illumination is the examination of goods. Almost always in stores, if an article requires critical examination, the one interested, whether he be merchant, employee, or customer, will look around in search of a place where the intensity is adequate. Certainly the chief concern of the merchant in this age of "service" in merchandising should be to have proper and adequate lighting. When its cost is considered together with increased attractiveness, efficiency, and general satisfactoriness, this relatively small investment will pay large dividends.

Keen merchandisers have studied these problems with the result that they have increased their standards of lighting over those of their neighbors. The large department stores and chain stores are better lighted than the average of the lesser stores and shops. A chain store opened in a certain small city where lighting standards were not high but its lighting equipment and intensity of illumination were those adopted by the management as desirable standards. The result was that this store was very conspicuous among its dingy neighbors. Other merchants objected to the lighting company and to others, but, of course, to no avail. The ultimate result of being forced

to give consideration to the economics of lighting was a greatly increased level of illumination throughout the neighborhood from which everybody — merchant, employee, and customer — profited.

It is the aim to avoid technical details in these chapters, so no attempt will be made to design lighting systems or to deal too much in foot-candles. The merchant can always find qualified representatives to aid in such matters. It is the aim here to discuss the matter broadly from a merchandising standpoint and to make suggestions or to present examples which are not generally available. In the larger stores, a foot-candle meter — a very simple and inexpensive instrument for measuring intensity of illumination — is a desirable tool for the engineer, sales-manager, or efficiency expert. It provides valuable information concerning intensity and uniformity of illumination and the deterioration of the lighting. It is an aid in studies of the relation between intensity and sales value or attractiveness.

DAYLIGHT

In discussing lighting from a merchandising standpoint, we cannot avoid touching upon natural daylight. Few stores have satisfactory intensities and distributions of daylight. For this

reason and the facts that daylight is likely to fail at any time and is certain to in the late afternoon, artificial lighting equipment is essential. Adjacent buildings, cloudiness, and architectural considerations reduce the effectiveness of daylight. Far from the front of the store or from windows, daylight is inadequate most of the time, so the artificial light must be used. This undependability makes it desirable to inquire into the cost of daylight, and into the possibilities of getting along without it.

Many persons express surprise at the intimation that daylight costs something to get it indoors, but a moment's consideration is convincing. Window areas cost more than plain walls; skylights cost more than roofs; cleaning and breakage of glass is expensive; glass areas permit the escape of considerably more heat to the exterior than ordinary walls and roofs; the additional heating plant and fuel cost appreciably. Figuring interest, depreciation, maintenance, and operation, we accumulate quite an expense to be charged against obtaining daylight indoors. In fact, daylight indoors costs as much as and often more than artificial lighting. But this is not all. Windows and light-courts occupy a great deal of wall-space and ground area. This additional charge is very large in congested districts of cities. And finally when all this expense is borne, we have natural



PLATE XXIX

The store can have all the advantages of natural daylight by means of modern artificial lighting units without the disadvantages of natural daylight *and at no greater cost.*



PLATE XXX

The "artificial daylight" units on the show case reveal the true daylight color-values of merchandise thereby helping to make the modern store independent of natural light.

daylight indoors undependable and poorly distributed. Clerks and customers, through long habit of depending upon daylight for accurate discrimination, make the journey to doorway or window to see the color of the goods. This consumes time and is annoying.

The developments in the production and use of artificial light have been so extensive in recent years that adequate dependable artificial illumination can now be obtained for less than the cost of natural lighting in many cases. Furthermore, the distribution of light and the uniformity of illumination with proper artificial-lighting systems are very superior to that ordinarily obtainable with natural daylight through windows. Scientific developments have also reproduced the color-quality of artificial light so that we now have artificial daylight. The tungsten daylight lamps are satisfactory for general lighting, for they reveal colors truly enough for most purposes. Their light blends well with daylight — an excellent characteristic where artificial light is reinforcing natural daylight. For the finest color-discrimination, stores, which strive for efficiency in service, have widely adopted the accurate artificial-daylight unit for their counters. Units of this sort are available which emit artificial light closely approximating north skylight — the accepted light of the expert in color discrimination. Many

merchants testify that merchandise can be sold more easily under proper artificial lighting than under natural lighting. Certainly there are few cases where stores are well illuminated by natural daylight as judged by what can be accomplished with artificial daylight. In some stores, booths and dressing rooms have been provided with artificial daylight units so that the customer can see just what the colors are by daylight without going to the door or window.

LIGHTING SYSTEMS

It is not the aim to discuss technical details of lighting systems but merely to point out some general principles. There are no adequate and well-defined terms for describing lighting systems, but fortunately we can avoid this handicap fairly well. A *direct-lighting* system is one which emits the light predominantly downward. A simple example is the pendent shade with open bottom. An *indirect-lighting* system is one which emits all or nearly all the light upward to be reflected by ceiling and walls to the merchandise. *Semi-indirect* lighting is a term for systems in which light is sent upward and also downward from such units as opal glass bowls or totally enclosing glassware suspended from the ceiling. Some systems have fixtures combining these in various proportions. There is a wide variety of lighting fixtures

from which to select suitable ones for any particular case. See Plate XXIX.

From the viewpoint of lighting as well as from other viewpoints there are three classes of stores namely (1) large department stores, (2) distinctive shops, and (3) ordinary small stores. Although the ordinary small store does not have the setting requiring special treatment of fixtures and lighting, it represents a field where it can be demonstrated that a certain degree of good taste is no more expensive than indifferent taste. The merchant of the small store can well keep his eyes on distinctive stores and observe what they are doing in the way of decorative schemes and lighting. He may find that there are many possibilities which he has overlooked for introducing color and good lighting appropriate to his business. The lighting of large stores, such as the department stores, has become fairly well standardized. Light is distributed quite uniformly by lighting fixtures containing large incandescent filament lamps in large diffusing glass bowls or totally enclosing forms. In fact the best practice now is enclosing diffusing glassware which is cleaned by a regular schedule. In order to insure satisfactoriness, all light-sources should be shielded or concealed from the eyes and a sufficient intensity of illumination should be provided. It has been a common error to mistake glare from brilliant

sources of light for high intensity of illumination. The test is eye-comfort and the ability to examine merchandise satisfactorily and without too close attention to it. In the case of large fixtures hung high, small all-frosted lamps can be used without causing undue glare if the background (walls and ceiling) against which they are used is fairly bright.

The best lighting system will be somewhat glaring when the surroundings, such as walls and ceiling, are very dark and, of course, these also render the system less efficient by absorbing much light. Under these conditions the bright portions of the fixtures are more or less glaring, due to the high contrast with the dark background. If dark walls and ceiling are desired in order to carry out a certain decorative scheme, very careful attention should be given to the design of the fixtures. In such a case it is best to use the direct-lighting system with deep reflectors of dense glass or contained in lanterns or other designs whose exterior is very subdued in brightness. It should be remembered that bright walls and ceiling contribute much to the feeling of a well-lighted store, and therefore go far toward contributing to the attractiveness of lighting. Of course, this does not mean that dark walls and ceiling do not have their place in distinctive interiors. Lighting, decoration, and architecture can be combined in

many ways to produce artistic and distinctive effects. See Plate XXVIII.

In large stores and even in shops there are many special lighting problems aside from those of psychology and esthetics. A dressing room for trying on gowns is best equipped with "daylight" lamps as well as ordinary lamps. This permits the customer to see the merchandise either as it will appear under natural daylight or under ordinary artificial light. Where theatrical costumes are designed and tried on, a room with foot-lights as well as border-lights may be provided. It would be of value to have colored lights in these circuits because this is a factor in theatrical apparel.

Rug racks can be illuminated by means of lamps in reflectors thus enabling the customer to see the rugs to advantage. This permits of a high intensity of illumination on the rugs under consideration without necessitating a high-intensity over the entire floor.

Display cases are often difficult to illuminate properly but usually there are electric incandescent lamps and reflectors which will meet the requirements. The problem is quite similar to the show-window but the smaller size of display cases usually is responsible for the difficulties encountered. There has been a marked improvement in lamps and accessories in recent years so that most problems are readily solved.

There are many stores where general illumination of sufficient intensity obtained from modern enclosed diffusing glass fixtures meets the requirements if the outlets are properly spaced. This applies to stores handling stationery, books, shoes, hardware, electrical supplies, as well as department stores. It should always be the aim to blend decorations, furnishings, and lighting with good taste. Incidentally good taste need not cost more than poor taste but, of course, elaborateness is left to the distinctive shop.

Stores handling groceries, meats, etc., should appear clean and should welcome the revealing power of adequate light. Fairly light walls and white ceiling with modern diffusing glass fixtures containing daylight lamps is a combination which is attractive and suggestive of purity and cleanliness. Color is a greater factor than most of us realize in judging meats and other foods. The daylight lamp has proved very desirable for such stores.

CHAPTER XIII

DISTINCTIVE INTERIORS

THE distinctive stores and shops are best for our purpose of indicating what can be accomplished by lighting, properly adapted to a specific store or shop with its characteristic decorative scheme. A few of these will be briefly commented upon. These are usually well furnished and appropriately decorated, and artistic appearance is of primary importance. In such cases architectural and decorative treatment, quality of woodwork, character of the floor and the lighting may be harmoniously blended to produce an appropriate effect for the high-grade specialized merchandise. Modern lighting presents many possibilities and is a more important factor in the effect as a whole than has been generally realized.

In considering lighting systems for distinctive stores, it is well to remember that there are a vast number of fixtures available and that the better manufacturers will furnish special designs appropriate for the particular case. Furthermore there are many devices such as, the portable lamps, urns, wall-boxes, cornices and specially con-

structed architectural features where light-sources can be concealed. From these, light can be diffused over the room thus adding the charm of mystery. Fixtures need not always be hung from the ceiling or fastened to the walls. Multiple light-sources on a fixture are often more charming than the single unit consisting of glassware, a silk envelope, or a parchment shade. However, it is often difficult to obtain sufficient light from chandeliers and other multiple-lamp fixtures without undue glare. An excellent solution in many cases is a combination of a number of small units with a large one or a combination of fixtures containing small lamps with a moderate amount of diffused light obtained in some other manner. For example, a large bowl or enclosing glassware may provide a large portion of the light required and lamps in smaller shades or round-bulb lamps may be added for certain effects. The latter provide life to the fixtures and sparkle to many kinds of merchandise. But in adding these additional light-sources care should be taken to avoid glare. Too commonly such effects are achieved at expense of eye-comfort. In another case the general diffused light can be obtained from light-sources in cornices, wall-boxes or urns. In considering fixtures for distinctive interiors it should be realized that here we deal with primary light and that life, splendor, brilliancy, quietude, softness and

other characteristics can be achieved and emphasized by the proper choice. But it should be further realized that no harmony can be achieved at the expense of eye-comfort.

Vision evolved to its present high state in human beings through millions of years of adaptation of natural light outdoors. As a consequence the human eye is better adapted to natural light than to artificial. Natural light comes predominantly from above so that the eyebrows were evolved as protective awnings; furthermore, the retina is adapted to dominant brightness from above rather than below. Therefore it is well not to inaugurate any radical distribution of light and brightness indoors. In fact, artificial lighting and decorative schemes have naturally followed approximately the distribution of brightness outdoors in the daytime and it is easily proved that this is fortunate where eye-comfort is desired. The author has also shown that we should consider two régimes, namely when the eyes are doing close work, such as reading, and when they are merely at play, such as during ordinary conversation. They are much more sensitive to improper and inadequate lighting and "unnatural" decorative schemes when "at work" than when "at play."

In distinctive interiors the aim should be to harmonize the various factors such as architecture,

ornamentation, furnishings, treatment of walls, ceiling, and floor, lighting fixtures and lighting effects with the merchandise, its source, quality, and use. In a perfect harmony no factor will be conspicuous. The deeper psychological aspects must be studied if the best result is to be obtained. In considering lighting a distinction should be made between lighting fixtures and lighting effects. Most persons if asked to appraise the lighting of an interior immediately turn their attention to the fixtures instead of judging the lighting effect upon the interior as a whole. The lighting fixtures are a means to an end and the end is lighting effect. Their appearance is no more important than any other ornaments of similar prominence. The final and forceful factor of lighting is the lighting effect. This is what creates or enhances the mood or expression of an interior.

Those who have not had opportunity to study the effects of various distributions of light in the same room cannot fully realize the powers of lighting. We all know that decorative schemes can do much toward establishing certain moods or expressions in interiors. These depend for their effectiveness upon the distribution and quality (color) of light. This is best illustrated by means of a room whose walls and ceiling are done in light grays. If the furnishings are also in gray we have reduced to a minimum the influence of the decora-

tive scheme. Such a room is sensitive to lighting effects, for a variety of expressions can be created by varying the distribution and quality of light. The further that a decorative scheme departs from the neutral one just described the less is its sensibility to the lighting. However, decorative treatment cannot be so fixed in any interior that the distribution and color of light cannot powerfully affect the mood or expression of an interior. Experience has shown that decorators and others do not have this point clearly enough in mind to appreciate fully the importance and possibilities of lighting effects.

The tools for obtaining lighting effects are the ordinary fixtures and specially designed ones; lighted ornaments such as vases and silk enclosures containing light sources; portable lamps of a wider variety than is generally realized; places for concealing light-sources such as urns, floor standards, wall-boxes, cornices and various ornaments; objects of diffusing glass such as plaques and columns; a great variety of sizes of electric filament lamps; accessories of colored glass such as caps, sheets, lenses, and globes; and for temporary effects colored gelatines and colored lamp-coatings.

In attempting to describe the possibilities of lighting and how it can be blended with the other factors of an interior to produce just the proper

mood and environment for a certain merchandise, it would be best to go into elaborate detail. But space does not permit such a treatment of a sufficient number of different kinds of stores and shops and it is felt that it is better to describe a number of types briefly rather than a few more elaborately. Therefore in the paragraphs which follow a number of representative interiors are briefly described with the hope that they will aid anyone interested in a specific lighting problem. In all these high quality is an ever-present factor to be emphasized as well as the factors peculiar to each kind of merchandise. Wherever possible the ceiling should be light in color in order to soften the lighting but, of course, in certain cases the mood or expression requires a dark ceiling. This also applies to the upper walls. In other words wherever it is possible these areas should be of a fairly high reflecting power for they conserve light, soften the effect, and lend attractiveness through their brightness. However, by no means should this be done in any case at the expense of appropriateness. This point is emphasized so that the light surroundings will be chosen whenever possible rather than sacrifice their advantages when there is no need for doing so.

Jewelry. In such stores richness and splendor are to be suggested and emphasized by the setting. The woodwork is of high-grade stained material,

such as mahogany or walnut. In a specific case the ceiling is panelled in a dignified manner and the walls have green panels with gold trim. In such an interior the lighting fixtures should have a number of light-sources in order to give glitter or brilliance to the jewels and other articles. It is difficult to obtain high-intensity illumination from the small sources alone without glare; however, fixtures can be made in which large lamps and reflectors are concealed, sending light upward or downward as desired. These may be depended upon for the major portion of the general lighting. Each fixture can then contain a number of small frosted round-bulb lamps or clear lamps in small glass shades. These multiple light-sources are essential for obtaining sparkle in gems and multi-highlights on jewelry in general. Under no conditions is a lighting system entirely satisfactory for jewelry stores without a number of small visible sources of light, although bare filaments should be tempered by frosted bulbs or diffusing shades. In other words so-called indirect lighting from concealed sources can be used for general lighting if other sources are provided as described. To illustrate what is meant by the foregoing the reader might examine a diamond outdoors under a great expanse of sky. The diamond will have no sparkle but in a theatre where many light-sources are visible it will be very brilliant with the many

highlights. This is an excellent example of the importance of lighting in merchandising. Not only should the lighting effect be suitable for the decorative scheme and the lighting fixtures correspond to the period, but the reflected images of the light-sources are actually the sparkle and life of the merchandise.

Millinery. In the shops of better class there is a daintiness appropriate to the merchandise which of course is associated with women. Woodwork is done in white, ivory or light gray and delicately trimmed. Pure white is generally too glaring and cold. The ceiling is nearly white and the wall-covering is fairly neutral. In fact, delicacy is the keynote and the predominant areas are of a neutral color that harmonizes well with the colorful merchandise. The carpet may have more color in it than the rest of the interior but if so it should be subdued to a medium shade. To carry out the general scheme, the windows may have silk hangings and the dainty chairs may be in subdued color with gold trimmings. Flowers and other appropriate furnishings complete the interior. Such rooms if done in a period style should have fixtures of the same period. There is no difficulty in obtaining fixtures of dainty design and ornamentation. From the standpoint of illuminating the merchandise, a general diffused light is satisfactory; however, women like to have

their jewels sparkle, so it is well to have some smaller light-sources to produce this sparkle. Wall-brackets may be used for this purpose or frosted lamps may be placed on the fixtures. The mirrors deserve special treatment. A wall-bracket at each side will illuminate the hat very well while the customer contemplates its becomingness. This and many other places should have artificial daylight in a booth or at the mirrors so that the true colors can be seen if natural daylight is inadequate.

Women's apparel. The millinery shop represents one kind of merchandise included in wearing apparel but let us assume a shop specializing in gowns or suits. Here the woodwork may be even of a darker finish, the ceiling may be of a cream tint, carpet green and tan, walls of gilt decoration, and draperies, chairs, etc., such as to harmonize with this less dainty setting. Here the lighting fixtures may be "sunbursts" with gilded or bronze metal and a large light-source concealed in each to provide the requisite illumination. A reasonable amount of sparkle is necessary in the lighting effect for reasons already given.

Men's clothes. The decorative scheme for men's stores is naturally of rugged solid character. Display-cases, tables, chairs, and other woodwork are commonly of dark stained woods and the colors of the walls are of a fairly neutral shade.

The ceiling is usually nearly white as it should be. The lighting should be of unusually high intensity and fairly uniform. Much of the merchandise is of dark colors which are very difficult to distinguish. The best solution is artificial daylight lamps of sufficient wattage to provide a high intensity of illumination. In fact, a moderate intensity of illumination from daylight lamps is better than a higher intensity from ordinary lamps for distinguishing the hues of the dark shades so common to men's exterior clothing, provided that the former intensity is not too low. In choosing colors for walls or floor coverings it should be noted that the color most preferred by men is blue. A suitable color therefore would be a medium shade of blue if the setting permits its use. See Plate VI.

Tea room. Such a place, frequented largely by women, is generally cozy and dainty of quality, character, and appropriateness are really striven for. A Colonial period is quite satisfactory. In such a case the ceiling is low and nearly white. The floor may consist of wide boards on which rag-carpet runners are laid. An appropriate fireplace, ivory chairs and tables, perhaps a few "stalls" suggesting the old tavern, daintily trimmed shelves and walls, and chintz hangings complete the setting. Portable "candle-lamps," using tungsten lamps with silk shades of light



PLATE XXXI

The lighting of distinctive shops should not only be useful and decorative but should be designed so that the particular merchandise appears to advantage.

warm tints, are exceedingly appropriate for such an interior. Colonial brackets properly located may be used. General lighting of high intensity destroys the coziness and is not in keeping with Colonial days. Some general lighting can be obtained if the small portable lamps have shades with open tops, for a certain amount of light will be emitted upward. The same is true of wall-brackets. If more general lighting is required, ceiling fixtures resembling oil-lamps or lanterns can be used sparingly. Electric lamps, tinted to emit light of the warm yellowish tint of the candle-flame, are extremely appropriate for such an interior. Women particularly like the warm tinted light. In this case, as in most others, lighting is a powerful factor and it can be the final touch or even the dominant factor.

Antiques. In such cases we think of darker surroundings suggestive of by-gone centuries or far-off lands. The decorative scheme of a high-class shop of this sort should be of a period style, Oriental, European, English, or Colonial, depending upon the predominant merchandise. The ceiling should be of a light color if possible, as a concession to modern lighting and visual requirements. Walls and floor-covering can be in strong color if desired. There are many polished surfaces in such shops which reflect annoying images of exposed light-sources; furthermore, light-

sources seen against dark walls are glaring. Modern fixtures consisting largely of diffusing glassware are scarcely in keeping with the setting. Old lanterns and silk parchment envelopes can meet the requirements if they have concealed within them large lamps and reflectors. These fixtures can be so designed as to send some light upward to the ceiling and some downward. By exercising ingenuity, modern lighting equipment which distributes the light properly can be housed in an antique exterior so that the fixture is suitable in every respect. In some of these shops a soft diffused illumination of low intensity seems most appropriate. By exercising ingenuity it is possible to obtain such an effect and still have adequate illumination for examining the merchandise. By eliminating the highlights and by subduing the brightness of the fixtures this end is approached.

Toys. The decorative scheme of a quality toy-shop naturally is suggestive of the nursery. The walls and ceiling may be nearly white, but there is always a place for children's colors, such as light blue and pink. Walls may be done in such a color, or if white or gray, one of these colors may be used for decorative lines and figures. Of course, the various vivid colors can be used with the familiar nursery figures if this more vivid color-scheme is desired. Diffused light is quite satisfactory and desirable. Pendent glass bowls or enclos-

ing pieces can be decorated with butterflies, animals, flowers, or conventionalized nursery figures.

Confections. The so-called candy store is often colorful in decoration, furnishing, and lighting and great variety in treatment is possible. It may have a ceiling of cream tint with gold trimming and walls in which fairly prominent colors, such as red, green, and blue, are employed on a neutral background. The woodwork, show-cases, tables and other furniture may be of walnut, mahogany, or of oak with one of the novel finishes. In such a setting alabaster bowls can be used for lighting fixtures and these may be supplemented with floor standards and portable lamps on the tables. Even in this more staid type of candy-store a touch of spectacular lighting is satisfactory; however, such shops with more freedom in decorative treatment lend themselves naturally to greater freedom in lighting.

In a certain candy-store which specializes in sweets from the Far East, an Oriental scheme of decoration is quite appropriate. Primary colors are used freely in decorating the ceiling and walls with conventional Oriental patterns. The floor is red and white mosaic. Oriental metal and glass domes are suspended from the light-colored ceiling. Oriental vases, rendered luminous by means of light-sources, are vitalized ornaments. A relatively low intensity of illumination would be most

fitting for the environment but a compromise must be made in such a case. Therefore high intensity is provided at the counters where sales are consummated but over the remainder of the shop the lighting is subdued both in brightness and intensity. One cannot see such an interior without crediting lighting and lighting fixtures with a prominent part in the total effect.

In candy-stores where refreshments are served, an outdoor environment can be imitated. Landscape paintings on the wall, a generous use of green and brown in the decorations, grass rugs, wicker or grass furniture, and other appropriate details provide a suitable setting. Now lighting can add the finishing touches. Around the pillars or across the pilasters a bit of horizontal lattice on which vines are entwined provides places for concealing lamps which are used to send light upward to the ceiling and upper walls. Large urns mounted upon floor-standards or elsewhere with artificial ferns and vines draping over the edge, provide excellent hiding-places for lamps. If stalls are used these can be touched with lattice and the partitions can be surmounted by hollow cornices in which lamps are concealed. From these places light is emitted upward toward a bluish ceiling with a resultant effect of subdued skylight. But this highly diffused light must be supplemented with some definite visible sources of

light. If the diffused light is to be considered as light from the day sky then portable lamps and wall-brackets are incongruous. If the diffused light is so feeble and tinted as to be considered as moonlight then the use of wall-brackets or small portables on the tables is quite satisfactory. If it is desired to carry out the daylight illusion, this can be done by having a visible source of light, such as a lamp in a glass shade, located above bits of lattice and vines. The shadows cast by the lattice and vines, subdued as they are by the diffused light, suggest the outdoors on a sunlit day.

Colored light has great possibilities in this kind of interior. It has the advantage of being readily changed from time to time or from season to season. Diffused bluish light makes a place seem cooler in the summer-time than the same place lighted with ordinary artificial light. Warm yellowish light of the tint of flames on the other hand, has the opposite effect and may be used in winter, thus obtaining variety which is so desirable in many interiors. Colored light has been used as a distinctive mark by which a chain of such stores is identified. It has also been used to lend individuality to unique refreshment places. For example, a candy-store serving refreshments is known as "Canary Cottage" and it is identified with canary light. Orange lamps are also used as distinctive lighting. Colored light should be used

judiciously and unmodified light should be available at certain important places, such as at the counter, and in some cases localized light can be obtained from small portables on the tables.

Restaurants. Here we have opportunities of extensive variety for introducing lighting effects, for such interiors vary in decorative scheme from the stately period interiors to the freer or even frivolous treatments. In period interiors the fixtures must conform to the period. For this reason chandeliers and candelabra are often found in stately interiors. In others, Old English lanterns, Oriental domes, and composition and art-glass fixtures with conventional period designs are found. In all these cases the brightness of the surroundings, the intensity of illumination, a certain degree of sparkle, and the tint of light are important considerations. See Plate XXVII.

The dining-room of one of our finest hotels is finished gorgeously in French Renaissance. The lighting fixtures are crystal glass chandeliers quite appropriate in design. After this modern palace was opened to the public it became evident that under artificial light it was somewhat cold in appearance. From the windows of this room in the daytime could be seen the beautifully landscaped grounds, beyond which were the beach and the lake. The decorative scheme during the day was quite in key with the outdoor landscape and seascape,

and therefore it was undesirable to redecorate aside from the great expense of doing so. Tungsten lamps tinted to produce light of the color of the candle-flame were installed in the crystal chandeliers with the result that this interior had the proper "warmth" at night without interfering with its charming harmony in the daytime. This is one of the most striking examples of the potentiality of artificial light.

A restaurant which receives daylight through a skylight may be appropriately decorated and furnished to give the outdoors appearance or effect of certain Roman and Grecian interiors. Foliage plants and a fountain in the center are used to complete the effect. With modern efficient light-sources the same effect can be obtained at night by installing lamps in reflectors above this skylight at a proper spacing so that a fairly uniform brightness of the skylight is obtained. This does not interfere with the daylighting.

Mistakes have been made by using the system of indirect lighting without any localized lighting to provide characteristic shadows. Under such lighting, the faces of the diners are almost without character, for modeling requires directed light. Furthermore evening dresses are devoid of highlights and jewels do not sparkle. A large amount of diffused light is desirable in most cases, but it should be supplemented by localized light such as

portable lamps, wall-brackets or luminous glassware or visible lamps on the pendent fixtures which are subdued in brightness so that they are not glaring.

A beautiful effect for the more frivolous or outdoor setting is obtained by having a low ceiling of lattice and vines. With sufficient space above it, a few large reflectors and lamps can be installed several feet above the lattice and preferably seven or eight feet at least. These cast shadows of the lattice and vines over the whole room with the effect similar to outdoors under an arbor or tree on a sunlit day. This is one of the most powerful illusions of lighting.

A variation of this idea is to have colored lights above the lattice. If two different colors, such as rose and light green, are alternated, the edges of the shadows will be of these colors. The mixture of the two lights gives an approximate white light so that the effect is colored shadows with white light where there are no shadows. This is one of the ways of obtaining unmodified light in general with certain color effects at the same time. If orange and greenish blue are used the colored shadows will be orange and greenish blue but the mixed light will be white. These are merely simple examples of many combinations and possibilities of colored shadows. The examples given have the advantage of not subjecting the diners and general surroundings to colored light.

A beautiful effect can be obtained by using vertical lattice beginning at a cornice well up on the wall. Behind this cornice lamps can be concealed for illuminating the background a foot or so behind the lattice. On this background landscapes can be painted. This gives the effect of extensiveness. Localized lighting can be carried out in various ways already suggested. Daylight lamps can be used in the cornice for illuminating the "distant" landscapes and flame-tinted lamps in portables on the tables or in the wall-brackets provide a moderate contrast which is pleasing.

Hotels. The brief discussion of the possibilities of light and color in restaurants applies to the principal feature of hotels. Modern hotels, owing to their magnitude, are in the hands of architects who give detailed study to architecture, decoration, furnishing and lighting. As a consequence modern structures of this kind are generally well done. The various eating-places in hotels are made distinctive by a combination of these factors and many such interiors are models of what can be done with lighting effects designed in proper relation to the other factors. Every type of lighting system and many combinations have been used with good effect and tinted light is largely responsible for the charm of many of these interiors. The cheerfulness of light of a warm tint has been recognized and therefore many hotels have adopt-

ed lamps tinted to produce light of the elusive yellow of the candle-flame. In fact, this is one of the fields for the use of light so delicately tinted that the color is felt rather than seen. There should be enough sparkle to give life to fine clothes and jewels but glaring sources should be avoided. Too often in the ball-rooms, formal dining rooms, and other large spaces done in period style, the architect reproduces lighting fixtures with too much fidelity. For example, a chandelier of a few centuries ago in which candles were burned cannot be adapted to modern light-source by merely replacing the candle holders by lamp-sockets without oftentimes a glaring effect. Fixtures must be adapted to present light-sources, not merely reproduced with fidelity.

The rooms of a hotel are composite bed-rooms with living-room furnishing added. General lighting from a ceiling fixture, wall-brackets at the mirrors, portable lamps on the writing-desk, and a bed lamp are usually installed in modern hotels. Generally the lighting is quite satisfactory if these various devices are properly located and equipped with shades.

Theatres. The theatre and amusement park are examples of the use of light for compelling attention. The thousands of electric lamps which outline buildings and various designs at amusement parks and the bright lights at the entrances

of theatres are testimonials of the fact that the managements are convinced of the attention-value and attractiveness of light. Too often these effects are gaudy and inartistic but they do what is desired. In recent years colored light and mobile lighting effects have been introduced into theatres. They provide novelty even though they are usually quite garish. Of course, the more forceful lighting effects are justified to some extent for the reasons that we are subjected to them only for a short time and also that the spirit of the occasion is in keeping with something of the sort. However, those responsible have not had time to learn that colored light is more powerful than the decorator's media and, therefore, they are giving the public a stronger dose of colored lighting than they mean to give in many cases. We can expect to emerge gradually from this garish or "jazz" stage to a greater refinement in the use of colored light.

Lighting effects should eventually take the place of some of the more elaborate effects produced by the decorator because of the mobility of the former. In other words, the decorative scheme of an interior, such as a public hall or theatre, can be subdued to grays with a moderate amount of trimming and the saving in cost can be invested in lighting circuits. By taking advantage of the possibilities of various distributions and

tints of light, a lighting artist can give the interior various expressions at will by merely the use of electric switches. Most of these effects should be produced by concealed light-sources and the effects should be confined predominantly to suitable areas. For example, a series of arches above a cornice can be given any tint desired if three circuits in the cornice are supplied with red, green, and blue lamps respectively and if each circuit is controlled by a dimmer. Another area such as the central ceiling panel or a dome can be painted with light of the same or other appropriate tint. Painting with light is a new field calling for the development of the lighting artist.

When anyone with artistic ability senses the new idea of painting with light and develops the extensive possibilities, interior decoration in many interiors will become partially a basis for lighting effects. Not only can painting with light be applied to areas of walls and ceiling but to specially constructed skylights and other transparencies. This new art is already launched but its possibilities have been barely sensed.

Auditoriums. A great many novel lighting effects can be produced in interiors as a permanent part of the effectiveness of the interior. Several years ago a large auditorium was constructed with a beautiful and extensive glass skylight very high above the floor. Above this skylight artificial

illuminants were used such as tungsten lamps, mercury-vapor lamps, flame-arcs, etc. These vary considerably in tint and by confining them to suitable panels the effect was beautiful. At the present time the effect can be obtained more simply by means of large tungsten lamps and colored glass accessories. One charming feature of this installation was due to the flickering of the yellow flame-arcs. This is also a part of the charm of lighted candles. It is well worth while to consider the reproduction of this elusive variety due to flicker by mechanical and electrical means.

In a very large auditorium recently built, more than a thousand large tungsten lamps in reflectors containing colored glass reflectors are used above the huge skylight and in a cornice extending around the gallery above the last row of seats. By mixing the red, yellow, green, blue, and colorless lights, a great variety of effects are obtained. This lighting equipment is of great potentiality for it is not only available for novelty and decorative effects but is always available as a factor in any special setting for any occasion. In this auditorium no natural daylight is admitted.

In a large private meeting-room a solid row of large reflectors containing tungsten lamps and colored filters extends nearly four hundred feet around the ceiling twelve feet from the wall. It illuminates a specially painted frieze on the

upper wall. By changing the color of the light, striking effects on the frieze can be produced. Set in the ceiling at various intervals are small searchlights which send narrow cones of lights downward. These illuminate certain stations on the floor for lodge purposes. The effect is powerful. When the room is used as a ball-room these cones of light can be colored and the dancers passing in and out of them produce a striking effect.

The wattage of lamps used in each of these very large installations is sufficient to supply light to an entire small city. This gives an idea of the magnitude of some of these new colored-light installations. These are merely examples of what is being done. The possibilities are very extensive both in large and small scales. It has been only recently that these possibilities have been practicable through the development of proper lamps and devices for controlling the distribution and quality of light.

Modifying daylight. There are many kinds of glasses available for diffusing and distributing daylight which enters windows and overhead skylights. One of the unsatisfactory features of natural daylight is the absence of a satisfactory distribution indoors. These are technical problems which can be solved satisfactorily sometimes but usually can only be partially solved. Although at best natural lighting indoors is not usually as satis-

factory as artificial lighting from an approved system, it can usually be improved by proper glasses such as diffusing, ribbed, and prism glasses. However, control over it is not complete in many cases.

Although the quality (color-value) of daylight is more suitable for human eyes than ordinary artificial light when the eyes are called upon to do close work, modifications of it by means of tinted glass are justifiable on the basis of psychological and esthetic effects. Daylight from the sky is too "cold" from an esthetic standpoint. For example, an afternoon ball in a daylighted room is lacking in the charm that the "warmer" tinted artificial light provides. Similarly a lounge of a hotel which receives light from the blue sky through an overhead skylight is "cold" in feeling. By the use of a slightly yellowish (not amber) glass a delightful "warm" tint can be obtained. Such a glass is available although difficult to find. Amber glass is a greenish yellow not as desirable as a yellow-orange tint. Sometimes the charm of stained glass windows is due to this change in color. North windows could be improved in many cases by the use of a slightly yellowish tinted glass. In fact, it is worth considering on a large scale in office buildings as well as in restaurants and ball-rooms. Modification of daylight would not be justifiable in stores or in

other places when the accurate discrimination of color is necessary.

The alteration of blue skylight to a warmer tint is more generally desirable than any other modification but there are other possibilities. A slight rose tint would be quite acceptable and charming in certain distinctive interiors. Little has been done in this direction notwithstanding the "coldness" of skylight in many interiors.



PLATE XXXIII

By means of artificial light exteriors can be rendered very conspicuous at night. The advertising value of flood lighting and outline-lighting has been firmly established by some of the most prominent merchandisers.



(Courtesy of W. & J. Sloane through Frank Presbrey Co.)

PLATE XXXIV

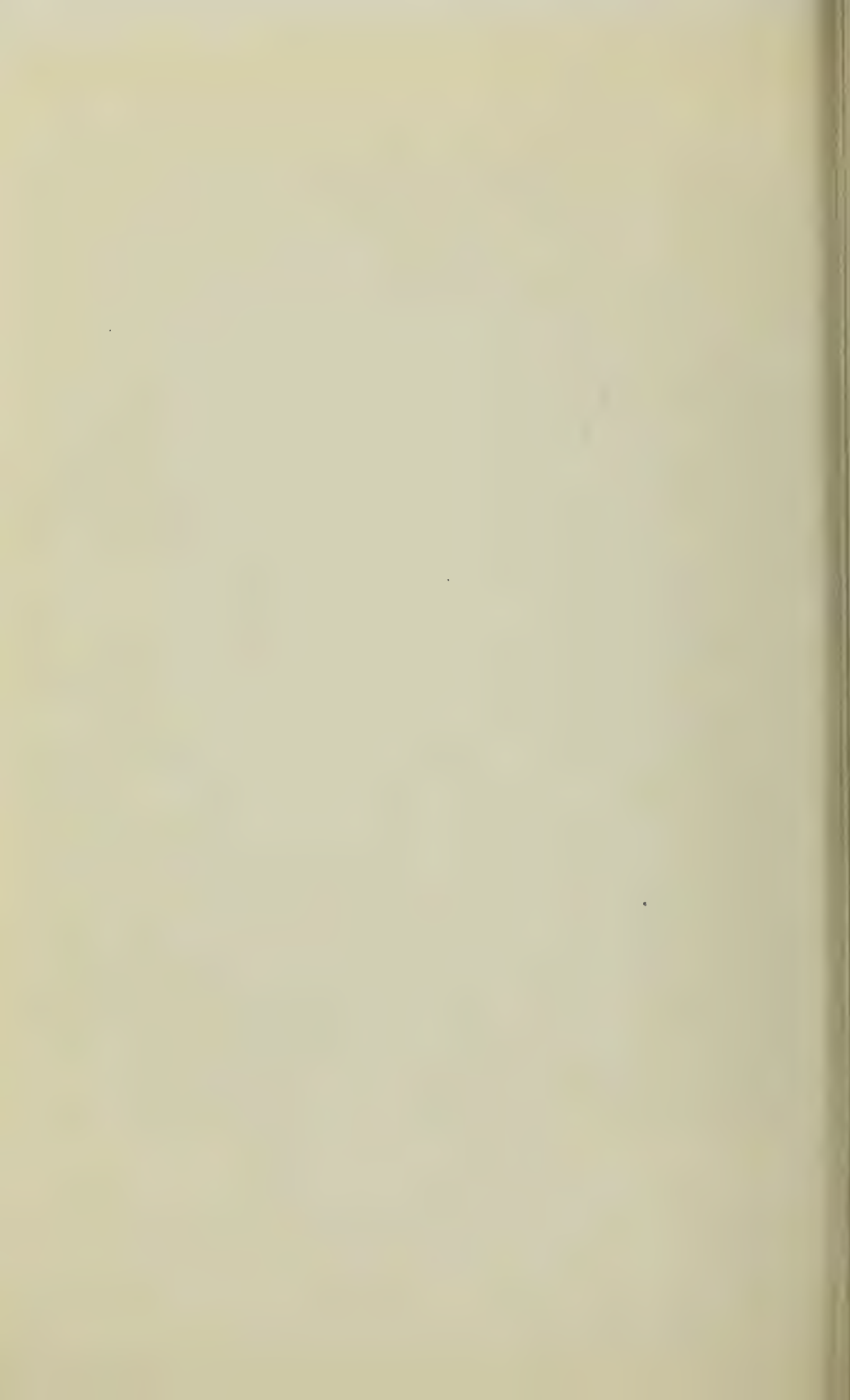
This plate is reproduced in color in XXXV.



(Courtesy of W. & J. Sloane through Frank Presbrey Co.)

PLATE XXXV

Note the value of color by comparing this with plate XXXIV.



CHAPTER XIV

ELECTRICAL ADVERTISING

AS AN advertising medium light has proved its value in many ways. Light is attractive. Fireworks and the aurora borealis command the attention of everyone. The reflection of lighting from far-off clouds, the night sky illuminated by a distant fire or steel mill, the glow of a city from a country hill-top, the gorgeous sunsets and the starlit sky attract and hold the attention. It is this appeal of light which makes illuminated advertising effective and has resulted in a variety of applications of artificial light for advertising purposes. Among these are the illuminated signboards, electric signs studded with lamps, outlining of buildings with electric lamps, and the flood-lighting of exteriors. For the sake of convenience the term, electrical advertising, is used to include all these and their modifications and combinations. It represents a comparatively new type of advertising but one whose value seems to be well acknowledged. The great white ways and the huge signs that flash their message to passing travelers at night testify that merchandisers be-

lieve in them. In fact, the proportion of publicity appropriations devoted to electrical advertising is appreciably on the increase. See Plate XXXII.

Signs are useful in designating the location of a place of business and also for broadcasting messages to the public. The modern merchandiser knows that this kind of advertising is valuable but the question arises as to which type of sign is the most effective for a particular case. The selection of a type of sign depends very much upon the distance at which the sign is to be used. The range or "carrying-power" depends upon the amount of light emitted or reflected, and inasmuch as the electric sign can be much more brilliant than the sign emitting reflected light, it can have a much greater range. In other words, it can deliver its message to more people than the illuminated sign and by virtue of its brilliancy it can eclipse its duller competitors. The "circulation" of signs located strategically in our large cities equals that of any newspaper of the city. Many tests show that nearly every person passing by will look at an electric sign in certain locations. It is a most natural act to look at a brilliant sign against its dark background of night sky. When a building is to be emphasized it can be outlined with lamps or flooded with light, thus obtaining advertising value quite apart from signs. See Plate XXXIII.

Electric signs appeared shortly after the commercial introduction of the electric incandescent lamp. The first signs were flat painted signs studded with lamps; that is, the letters were painted on the board and receptacles for lamps were fastened to the letters. These "flush-letters" did not stand out with the highest contrast because the background — the sign board — received considerable light. Next the letters were raised and this "block letter" was an improvement over the flush letter. Then the letters were sunk considerably below the level of the sign-board, so that the background did not receive much light from the lamps. Therefore, these "groove letters" containing sockets and lamps stood out with greater contrast and were a decided improvement. Such signs were rather bulky especially when they were double-faced. This groove letter was the forerunner of the modern grooved or wall-type letter consisting of metal trough in which the sockets and lamps are concealed. These letters are very bright throughout a wide angle because the sides as well as the bottom of the trough are painted white. They are very bright against the sky or other dark background.

At the present time there are many other developments. In some of these the lamps are contained within the sign and transparent glass letters or perforated metal letters are bright by emitted

light. Glass lenses or "bull's eyes" are used to some extent. An advantage of the opal-glass letters is that they can be raised and therefore recognized at a large scale. Cutouts in metal and painted transparencies are also widely used. Many of these have the advantage of using larger and fewer lamps than the signs studded with sockets and lamps. A recent departure has been to paint a large background white and to support large black letters at a distance in front of it. Lamps are concealed behind these black letters in grooves or reflectors, and these lamps illuminate the white background. The letters are seen silhouetted against the brightly illuminated white background. Some combinations of the electric sign with the illuminated sign-board are in use. Of course, one of the desirable aims in the design of signs is that they be legible in the daytime as well as at night. This is not possible in the case of many signs which flash more than one message, but even in such cases daylight-value can be preserved by not overlapping the two or more messages.

Electrical advertising involves such characteristics as legibility, contrast, brightness, motion, size, position, novelty, attractiveness, color, message, picture and border. The elaborateness which is warranted depends upon the specific case and upon the location and environment of the

sign. Surely it is wasted expenditure to construct a sign where it cannot be widely seen or one which is so "inferior" to its nearby competitors that it will not attract attention. Furthermore it must attract *favorable* attention. On the other hand the law of diminishing returns is operative in this field as elsewhere and a sign should not be elaborate beyond necessity or effective returns on the investment. These factors cannot be satisfactorily studied except by giving detailed attention to a specific case. Even then judgment is a predominant factor.

The use of poster boards, painted signs and electric signs is already so extensive that many million dollars are spent annually in these forms of advertising. The use of color in signs is based upon the same general principles as in magazine advertising although modified when necessary to meet the peculiarities of sign advertising. Therefore the earlier chapters contain material which is applicable to this field as well as to others already discussed. A sign must attract attention and then sell merchandise. Posters and painted signs are in a sense enlargements of magazine advertisements. Therefore attention-value and selling-value are achieved in the same manner as in printing. In these we deal with reflected light. In the case of electric signs we deal with primary light which has the advantage of greater brilliancy

but the disadvantages of limitations in the formation of the message to be delivered. Owing to the many differences between the so-called billboard and the electric sign they are treated separately. Signs can be classified as steady and flashing or continuous and intermittent; however, this distinction is not as fundamental as that which implies direct light and reflected light respectively.

In a survey of electrical advertising in one of the largest cities in the United States it was found¹ that the percentages of the total electrical energy used in electrical advertising were as follows:

Marquees	8 percent
Enclosed lamp signs	16 "
Illuminated sign-boards	20 "
Exposed-lamp signs	56 "

From a study of about 2000 signs in the same survey the distribution according to the class of business and the average wattage per sign were determined. In Table XII the order of rank of the types of business as to these two factors are shown. It is seen that restaurants use the most electric signs but theatres on the average use the most wattage in their signs. In fact, there were twice as many restaurant signs as drug signs.

¹ H. H. Magdsick, National Lamp Works, Cleveland.

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TABLE XII.—ORDER OF RANK OF TYPES OF BUSINESS AS TO NUMBER AND WATTAGE OF ELECTRIC SIGNS IN USE.

<i>Number of Signs</i>	<i>Average Wattage</i>
Restaurants	Theatres
Drugs	Newspapers
Automobile	Markets
Clothing	Banks
Motion Pictures	Motion Pictures
Hotels	Furniture
Banks	Music
Shoes	Electrical Supplies
Dentists	Automobile
Confectionery	Florists
Bowling	Dance Halls
Electrical Supplies	Clothing
Furniture	Hotels
Tobacco	Real Estate
Music	Tobacco
Clubs	Jewelers
Theatres	Confectionery
Jewelers	Restaurants
Dept. Stores	Bowling & Billiards
Markets	Drugs
Real Estate	Shoes
Dance Halls	Clubs
Laundry	Dentists

The same survey extended to electrical advertising in other cities of various sizes indicates the following average values of watts per inhabitant and signs per 1000 inhabitants.

TABLE XIII.

Population	Watts per Person	Signs per 1000 Persons
Less than 5,000	1.4	3.2
5,000 to 15,000	2.0	3.2
15,000 to 100,000	2.4	2.0
100,000 or more	5.4	2.5

It is seen that the wattage per person increases considerably as the population of cities increases and that the number of signs per 1000 inhabitants remains fairly constant or in fact generally decreases.

POSTER BOARDS AND PAINTED SIGNS

Such signs being, in a sense, enlargements of magazine advertisements, the use of color is based upon the same general principles; therefore, the material of the early chapters is directly applicable but the various characteristics of color will not be discussed again. However, there are some fundamental differences between these large advertisements and those in magazines. The printed message on the sign-board must be reduced to a minimum of words because the passerby has little time for reading a long message. High concentration on a single idea must be achieved if the sign-board is to be effective. In the magazine advertisement this is also a desirable feature but a reader is more likely to pause long enough to read a magazine advertisement before turning a page or an attractive folder in his hand before throwing it into the waste-basket. A passerby generally cannot be expected to do this. There are some large distinctive signs along the automobile highways which give the tourist timely information.

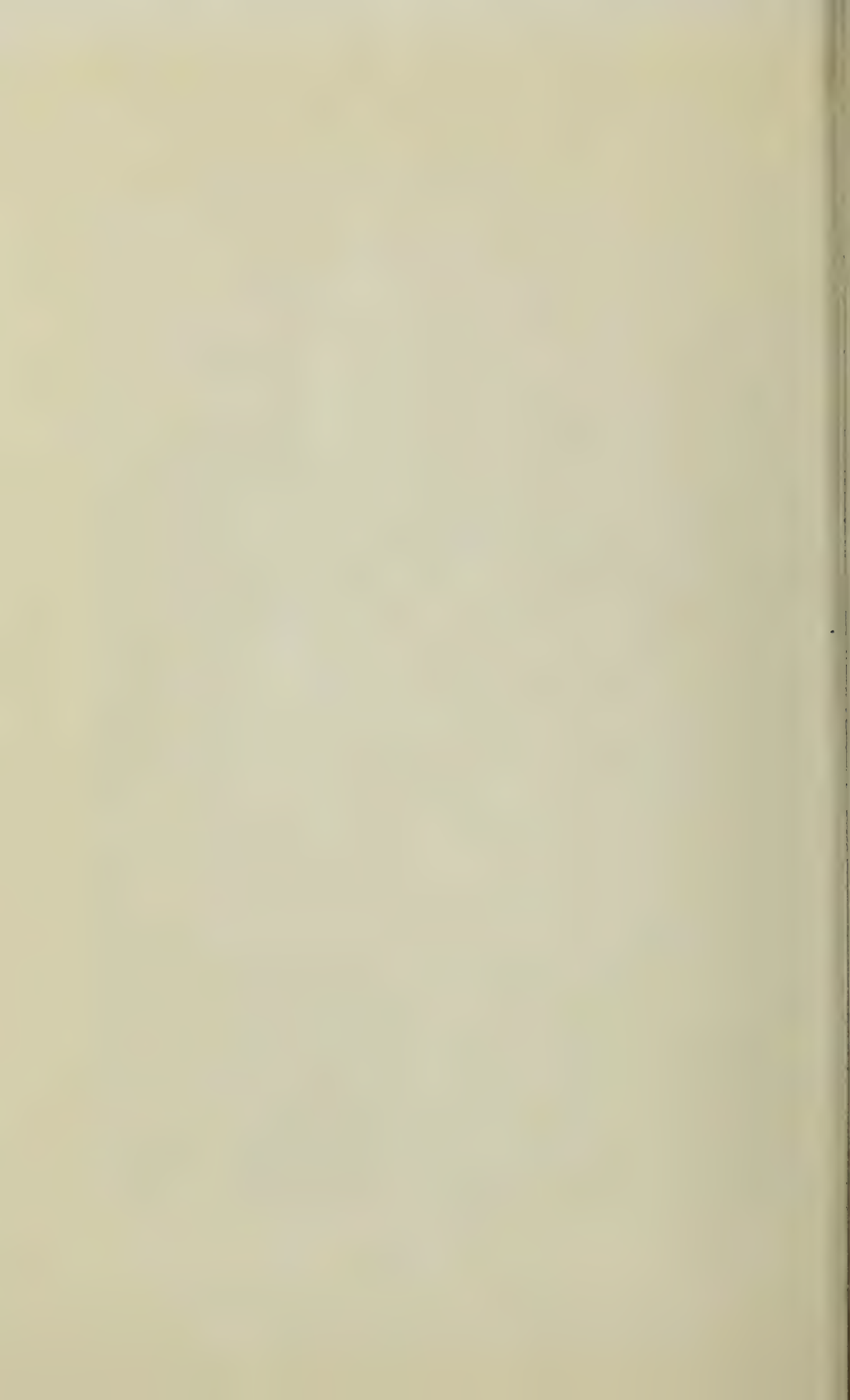


Reprinted from "How to Grow Roses," Robert Pyle, West Grove, Pa.

PLATE XXXVI

Color printing depicts everything but the fragrance of flowers,
and it may even suggest that

This paper is Dill & Collins Company's Black & White Coated



Doubtless some tourists slow down or stop to read the information and the sign achieves its object, which is to register the advertiser's name on the mind of the observer. However, high concentration on a single idea is quite generally essential if sign-boards are to increase sales.

Another factor of primary importance is legibility. Of course, this is also important in magazine advertisements but in the latter case it is easy to achieve legibility. In fact, this is done almost unconsciously because the copy is designed of approximately the size of the final advertisement. Holding such copy or the printer's proof at arm's length reveals its degree of legibility. However, even magazine advertisements through carelessness or lack of consideration are not always of the highest legibility. This is easy to test by setting up the copy and walking away from it. If the letters do not run together at a reasonable distance the legibility is satisfactory. The white spaces between black letters should be at least as wide as the black letters and preferably larger. It is more difficult to predict the legibility of large posters and painted signs because of the distance required for the experiments. These are matters of vision which should receive careful consideration.

Many sign-boards fail to deliver their message effectively because the lettering is too decorative,

the contrast is too small, or the letters are not large enough. Many persons have defective vision to a sufficient extent to make a sign ineffective to them as they speed by even though it may be very legible to a person of normal vision. Plain letters are much superior to decorative ones. In ordinary reading we experience difficulty in reading Old English type and even simplified modifications of it. Nevertheless many thousands of dollars are wasted each year on signs with letters too decorative in character. The proper size of letters can be determined easily by viewing the copy or small design through a reducing glass. A large factor of safety should be allowed in order to insure legibility on dark days, in bad weather, and to allow for the speed of traffic.

Color contrasts on sign-boards should be striking. Vivid colors are quite justifiable outdoors. However, in obtaining color-contrast it is a safety measure to achieve also a brightness-contrast. For example, a deep orange and a light green is a striking color-contrast but they may be of equal brightness. If so there is no brightness-contrast and the sign fails when color-vision fails. By the failure of color-vision reference is not made to the small percentage of human beings who are color-blind although this is a factor. What is meant is that color-vision fails for all of us toward the end of the day when there is still sufficient light to see

strong brightness-contrasts. This is an important factor which is commonly overlooked. In combinations of colors, when one is a dark color and the other is a bright one, such as a blue and yellow combination, there is no danger of having color-contrast without brightness-contrast. Danger of this character is found with red and green, orange and light-green, green and purple, yellow and gray, and, of course, with any color and gray of the same brightness. It is difficult to separate mentally brightness and color but by close observation this can be done usually sufficiently well for practical purposes. However, when in doubt lighten or darken one color.

Owing to certain complexities of vision, letters of certain colors are seen more clearly than others, assuming brightness-contrast to be the same in all cases. It is easier to focus red, orange, yellow at a distance than green, blue, or violet. Furthermore there is the phenomenon termed irradiation. This is what makes the bright portion of the moon appear larger than the dark portion or makes a bright lamp filament appear larger than it does when the filament is not bright. To some extent this factor complicates the legibility of bright painted letters and is a very important factor in electric signs where the letters and other portions of the sign are very bright.

A number of years ago results were reported of

experiments on the legibility of various combinations of colors in advertisements for reading at a considerable distance. The rank of legibility was as follows:

- | | |
|--------------------|--------------------|
| 1. Black on yellow | 8. White on red |
| 2. Green on white | 9. White on green |
| 3. Red on white | 10. White on black |
| 4. Blue on white | 11. Red on yellow |
| 5. White on blue | 12. Green on red |
| 6. Black on white | 13. Red on green |
| 7. Yellow on black | |

In each case the first color is that of the printed matter and the second color that of the background. Of course, it is dangerous to draw conclusions too finely from such data when the physical characteristics of the colors such as brightness and saturation are not available; however, the data are interesting and may serve at least to indicate the importance of color combinations. Legibility is not the same as attention-value but there is an intimate relation.

Artificial lighting has done much to increase the effectiveness of poster boards and painted signs. Many of these are more striking at night amid dark surroundings than in the daytime when they have a great deal of competition for attention. The problem of lighting such signs is rela-

tively simple and has been solved satisfactorily. Up to the present time colored light has not been used to an appreciable extent although the possibilities are quite extensive.¹ Lights of different color can be played upon the sign successively or a colored light can be superposed upon the white light to bring out certain details such as trademarks. By using tinted light on a scenic painting, effects such as sunset and moonlight can be produced in addition to the normal effect. Combinations of colored illumination with white spotlights are effective. Actual disappearing effects and apparent motion were devised by the author many years ago by properly relating the colors used on the sign to the colors of illuminants. These and the underlying principles are described in the reference indicated. With glass accessories now available for obtaining colored light, we should expect a more extensive use on sign-boards. Some of the possibilities of colored light have been discussed in connection with show-windows and displays. Many of these are applicable to the sign-board. Colored light not only alters the hues of colors but also their brightness; therefore, it affects color-contrast and also brightness-contrast which are the basis of numberless effects.

¹ Color and Its Applications, 1915 and 1921, Chap. XII, M. Luckiesh.

ELECTRIC SIGNS

Electric signs or signs on which the lamps are exposed have the great advantage of brilliancy. It has been shown that the range or visibility of an uncolored light-source increases with its candlepower. Range is an important factor in exposed-lamp signs and those designed for long-distance legibility must emit large quantities of light. Of course, legibility also depends upon the size of the letters and to the relation of the width of the lines comprising the letter to the size of the letter. The atmosphere containing dust and smoke absorbs blue and blue-green light more readily than yellow, orange, and red. This is why the setting sun is reddish in color. For this reason the rank of colored lights of equal candlepower according to range of visibility is as follows: red, orange, yellow, green, blue. Of course, if colorless lamps of equal candlepower are covered with colored glass caps, the range of each will not only be determined by the color but also by the brightness. The red cap absorbs so much more light than the yellow cap, for example, that the range of the yellow will be greater. The rank as to range of visibility will be approximately as follows: yellow, orange, red, green, blue. These statements are based upon the assumption that these colors are of equal purity or saturation.

There are many technical details of the design of signs for legibility that are beyond the scope of this book. Among the work done on this subject that of C. A. Atherton¹ is the most recent and complete. He found the relative legibility of the letters of the alphabet based upon the letter E, which is the most commonly used letter, to be as given in Table XIV. The measurements were made in electric signs, the width of the letter E being three-fifths of its height. It is seen, for example, that A is more legible than B.

TABLE XIV.—RELATIVE LEGIBILITY OF GOTHIC LETTERS.

A—1.30	J—1.21	S—0.95
B—0.85	K—1.06	T—1.15
C—1.07	L—1.19	U—1.07
D—1.03	M—1.13	V—1.08
E—1.00	N—1.00	W—1.13
F—1.04	O—1.06	X—1.08
G—0.92	P—1.04	Y—1.04
H—0.92	Q—1.06	Z—1.01
I—1.41	R—0.97	

The attention-value of an electric sign increases with its brightness and this has led to the use of larger lamps. In many cases this is quite satisfactory and has greatly increased the attracting power of the sign. However, in signs with small letters there is a point at which another increase in the size of lamps produces so much halation or

¹ Trans. Illuminating Eng. Soc., 1921 and 1922.

irradiation that the letters "melt" or run together. The result is low legibility. These are factors which should be taken into consideration but they may be left to the designer.

Lettering and pictorial representation must be simple in the bright lamp-studded sign or there is great risk of illegibility. This is a limitation that the designer may counterbalance with the effectiveness of color and motion, the possibilities of which are endless. Motion depends merely upon special wiring in some cases and, in others, on the superposition of two or more signs. There is no question as to the attention-value of motion but it seems unnecessary to resort to it excepting in the case of powerful competition of neighboring signs.

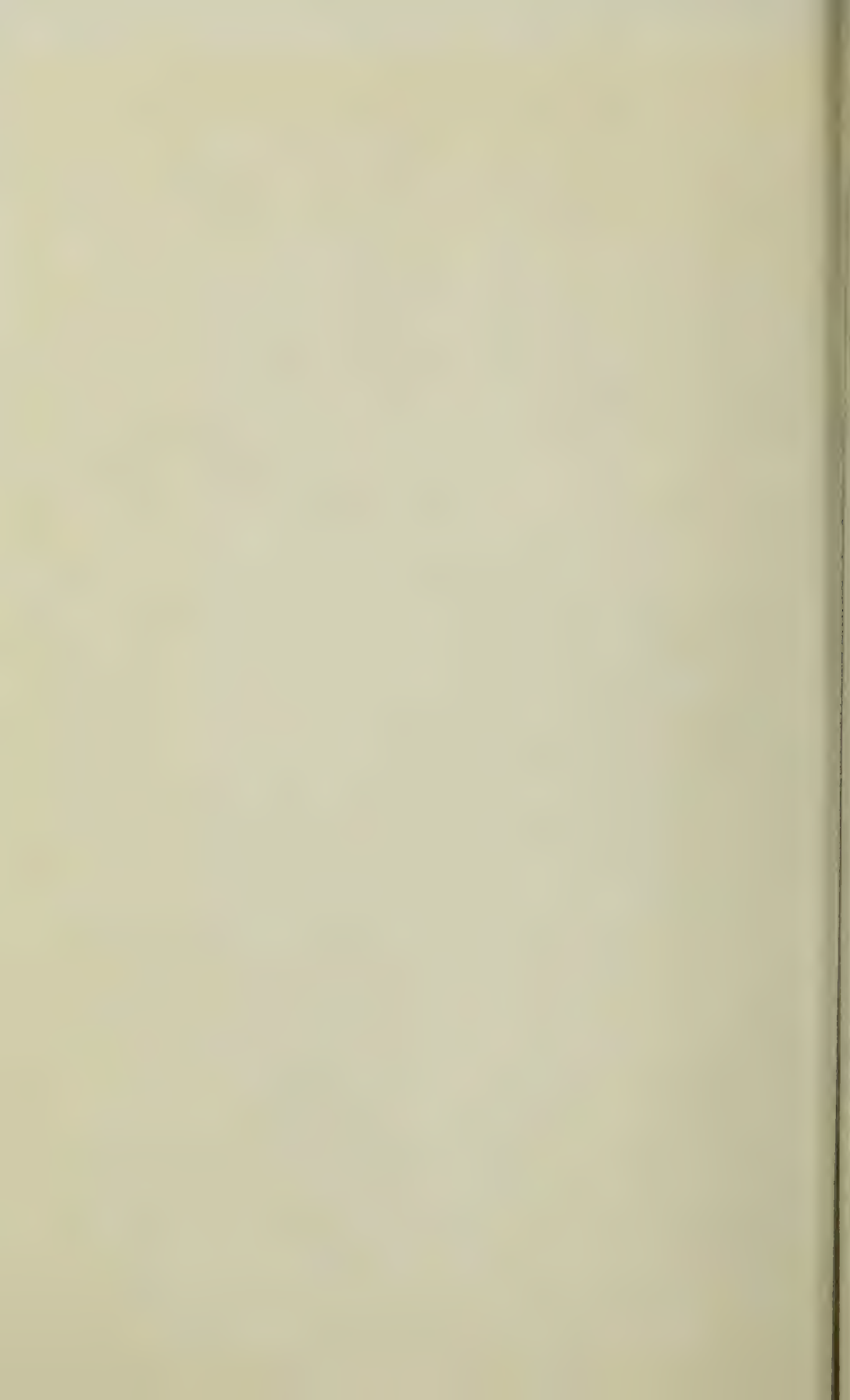
Color has many possibilities as it has in other fields which have been discussed in previous chapters. Its use is guided by the same principles. In electric signs it has the advantage of high brightness and can carry its message much farther than when it is used as pigment. Simple uses of it in the electric sign are to be preferred to complex usage. Medium tints produce more artistic results than the pure colors so commonly used. Charming effects can be obtained by means of regular lamps such as flamentint, vacuum tungsten lamps; gas-filled lamps, and daylight lamps. These provide a range of tint from the yellow of



(Courtesy of Kohler Company)

PLATE XXXVII

The solid blue in the background emphasizes the white fixtures; it is a "retiring" color; it is associated with water; it suggests coolness and cleanliness. In fact, it has no rival for the present purpose.



the candle flame to approximately white light. The matter of contrast is very important. For example, daylight lamps which in reality emit white light appear a bluish white in signs by contrast with ordinary lamps.

Colored lights of moderate tints carry further than the pure colors and have the advantage of not being too harsh in brightness-contrast as well as in color-contrast. If pure colors are to be used the bright color should be used to carry the important message. For example, if blue and yellow lamps are chosen, the blue should be in the border and the yellow in the printed message. One of the best moderate uses of colored light is in the borders although it can be used throughout the pictorial representation. In view of the material in other chapters which bears upon the subject of color usage it does not appear necessary to discuss this matter further at this point.

EXTERIORS

This is the first form of exterior decoration by means of light. Rows of lamps outline the principal architectural features of the building. It is effective in places where flood-lighting is out of the question. It is the only practical means of attracting attention to a structure of dark material by light on the structure itself. Sometimes diffus-

ing glass has been installed in the cornice and elsewhere and lamps are installed behind the glass. This is a means of illuminating or outlining special features of the architecture. Outlining of buildings can be done in an attractive manner as a means of high-class advertising but the impression of quality is gained only when the building is pretentious in size and the outlining is well done. This method is often adopted by small stores not handling quality merchandise and apparently with success.

Flood-lighting has yielded some very beautiful results. This method really reveals the building and its ornamental details but the outlining method conceals the building and replaces its details by rows of light-sources. The flood-lighting is usually less expensive and easier to install. Tall or isolated buildings are particularly attractive when flood-lighted. This method is practicable only for buildings of light-colored material, such as sandstone, marble or terra cotta, and to the light-colored portions of dark brick buildings. The result is usually produced by means of search-lights and projectors designed for the purpose. See Plate XXXIII.

CHAPTER XV

THE ESTHETIC SENSE

MANKIND'S reactions to the outer world are the results of messages recorded by the senses of which vision is by far the most active and important. Advertising must depend almost entirely upon appealing through the visual sense and merchandising, to a very large degree. Therefore the billions of dollars that are expended in advertising and merchandising should be directed by a knowledge of the psychology of visual appeal. In other words, the developments of these fields into sciences must largely depend upon the discovery and coördination of data pertaining to visual appeal.

Light and color influence human beings very definitely and in many respects quite uniformly regardless of race, nationality, and culture. Then there are certain differences due to race; additional ones due to nationality; and finally the state of culture contributes some further differences. Early chapters deal with the language of light and color and here and there throughout the book, the esthetic sense is touched upon. However, some

comments upon esthetic sense and popular taste appear to be a fitting finale in this attempt to analyze light and color as sales media.

Everywhere about us we read the records of individual taste (or lack of it) and of the popular taste of large groups differing in culture. Many of these records are discouraging, for good taste, well defined and believed in, is relatively rare. Mankind can be divided into three classes as to esthetic sense or taste: (1) a small non-creative group, unconscious of beauty or of its absence; (2) a very large uncreative group, conscious of beauty when it is present but practically unconscious of its absence; (3) a very small creative group keenly conscious of beauty and perhaps even more keenly conscious of its absence.

The first group are the clods, gathering none of the sweet joy of living, passing the seasons and years unconscious of the higher things which human beings are capable of enjoying, guided by animal instinct, gratifying animal urges and influencing progress about as much as workhorses. To this group necessity dictates and the esthetic sense is a closed door. The second group is the "general public," with scanty imagination but with a dormant esthetic sense, which can be aroused. In this great group artistic appreciation can always be awakened by visual appeal. To the third group beauty and artistic

environment are the real joys of living. The persons of this group enjoy the beautiful things and environments along life's highway for they have the capacity for doing so. They also miss them when they are absent. This group visits the quality shops and distinctive interiors along with many of the second group.

There are several obvious reasons for this dormant esthetic sense of the public as a whole, two of which are quite prominent. Most persons in this country have little fundamental "schooling" in artistic appreciation. Their scanty taste is acquired from their surroundings, from homes, from merchandise, from stores, and from other interiors. They acquire what they do largely by accident without much definite encouragement or direction. As long as our schools do not develop a well-defined appreciation of beauty, the aims of artists in business should include this objective. Beautifying our own small portion of the world is a worthy object and in manufacturing, advertising, and merchandising, artistic expression pays, for it appeals to the people even though the masses are not consciously influenced by taste.

Many of our school-rooms are unesthetic notwithstanding the fact that good taste expressed in quiet color-schemes and simple furnishings is no more expensive than that born of thoughtlessness or of poor taste. It is true that in grade schools,

academic courses in "art" are given but that a continuous course represented by artistic surroundings, by good pictures, and by good taste expressed in many other ways, is too often lacking. And then finally nowhere in the schooling is there any broad instruction regarding the value of beauty and of its appreciation. We get out of a painting or of any artistic ensemble only in proportion to what we put into it. Without a developed esthetic sense we have little to pour into a sunset, or painting or distinctive interior to be returned greatly enriched.

The public unconsciously craves beauty. It recognizes, to some degree at least, articles of artistic merit when it sees them. Manufacturing, advertising and merchandising need individuals trained to think and to act artistically. The art-schools are turning out young men and women with delusions that they wish to be Corots and Rembrandts. Those art-schools who fail to convince their students that the more utilitarian fields for artistic expression, such as manufacturing and business, are worthy and unsaturated ones, at least should warn these embryo artists that the demand for art for art's sake has decreased in recent years relative to its supply. It would be kindness to tell those leaving the doors of the art-schools that the world of business needs men and women of artistic training and that this is the

road to happiness and plenty. By doing so the public would be benefited because its contact with artistic expression would be greatly increased. And while the art-museums are doing splendid work in developing artistic appreciation in the general public, the every-day contact can do much to elevate taste.

Why does my Italian waiter in my favorite Roma hum *Il Trovatore* while his American contemporary whistles "jazz"? There is something in the all-pervading spirit of a country which makes artists of peasants or the masses appreciative of artistic expression. We need in this country (and are gradually getting it) an all-pervading spirit of artistic expression. In merchandise and in its surroundings, such expression is not necessarily more costly than lack of it and it is more profitable. Business as an educational institution is in a dominating and strategic position. The advertising, the merchandise, the show-window, the interior decorative scheme, the furnishings and the lighting are teachers that are ever-present and ever-teaching. By the introduction of good taste into these factors, they can appeal to the public more effectively and in turn be more attracted to.

Taste need not be confined to the store and to its merchandise. In the factory a pleasant color-scheme does its good work too. Instead of dingy unesthetic surroundings, we need not go to the

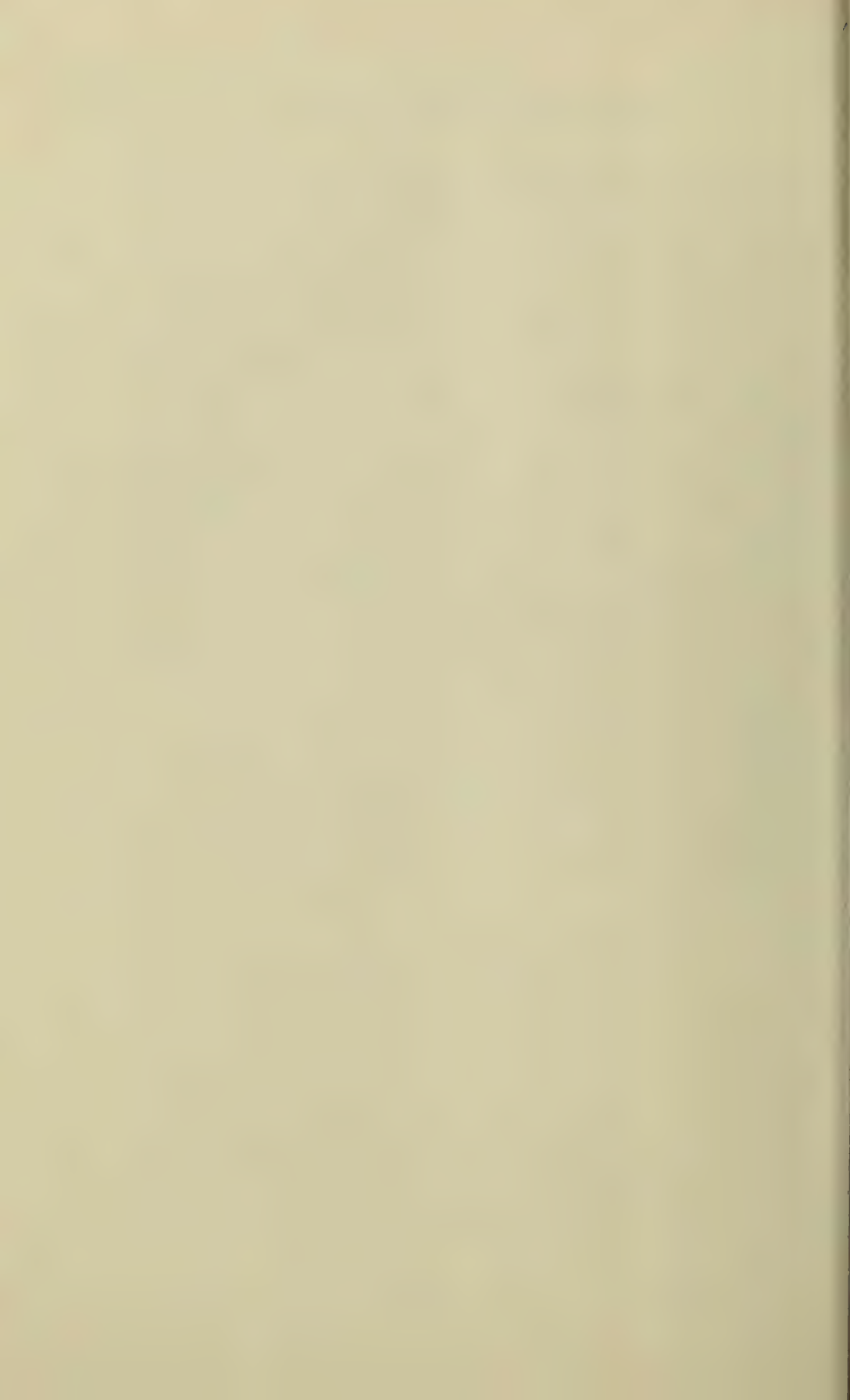
extreme of glaring white walls and ceiling. The factory employes are entitled to esthetic surroundings, at least when they do not cost appreciably more than ugly ones. A shade of olive green for the lower walls, a very light shade of green for the upper walls and a cream tint for the ceiling is pleasant. It apparently alleviates to some extent the heat of summer while the cold in winter is well taken care of by the radiators. Piping and radiators need not be of funeral black. Why not a pleasanter color in harmony with the color-scheme? The lighting system can also contribute much toward the achievement of a pleasant environment.

In our offices we need not be pachydermatous as to our surroundings, even though such a physical armor may be considered essential in certain business transactions. A room with northern exposure may have buff walls and ivory ceiling and a tan rug to give it warmth. In a southern room the subdued green color-scheme is quite suitable. An ornament here and a good picture there, and lighting without glare and of sufficient intensity can do much toward creating an environment which constantly exerts a subtle influence upon the occupants. All persons who ascend the scale sufficiently to inhabit office buildings are sensitive to their surroundings whether conscious or unconscious of their influence.

In all the fields of artistic expression in business, light and color have major rôles. Psychology is the science most prominently involved although physiology and physics are also pertinent to the fields which have been invaded in these chapters. Psychology is one of the most elusive sciences and is one of the newest from the standpoint of experimental research. Much data is still needed but time and effort will yield them. However, in the meantime business should utilize the available information much more extensively and intensively than it has in the past. Recent years have yielded opportunities, information, and developments which have greatly extended the potentialities of light and color as sales media and it has been the aim of this book to point these out and to show how to utilize them. In other books the author has developed allied phases of light, color, lighting and vision which should be helpful to those who would further pursue the study of light and color.

OTHER BOOKS BY THE AUTHOR

- “Color and Its Applications”
- “Light and Shade and Their Applications”
- “The Lighting Art”
- “The Language of Color”
- “Artificial Light — Its Influence on Civilization”
- “Lighting the Home”
- “Visual Illusions and Their Applications”
- “The Book of the Sky”
- “Ultraviolet Radiation”



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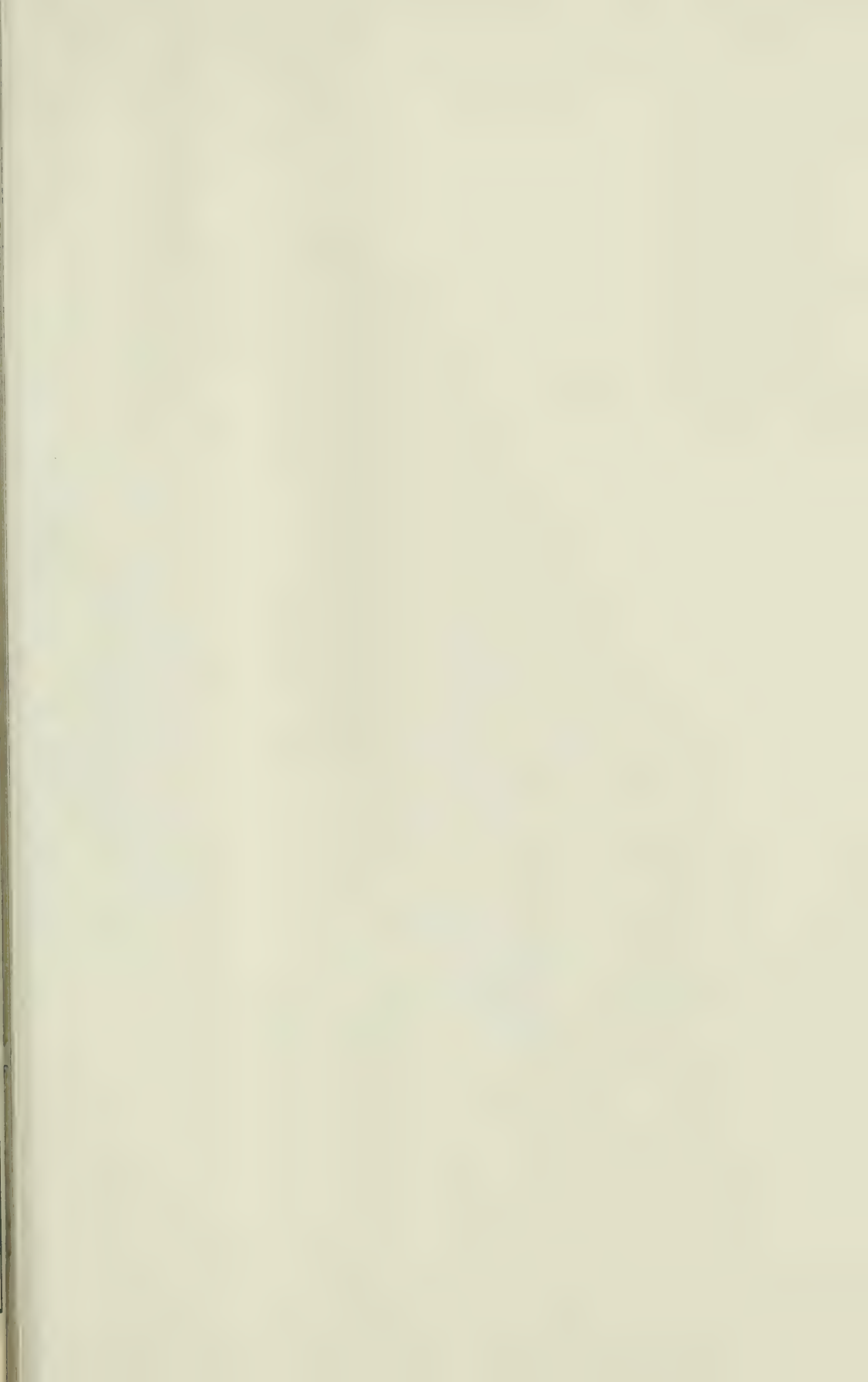
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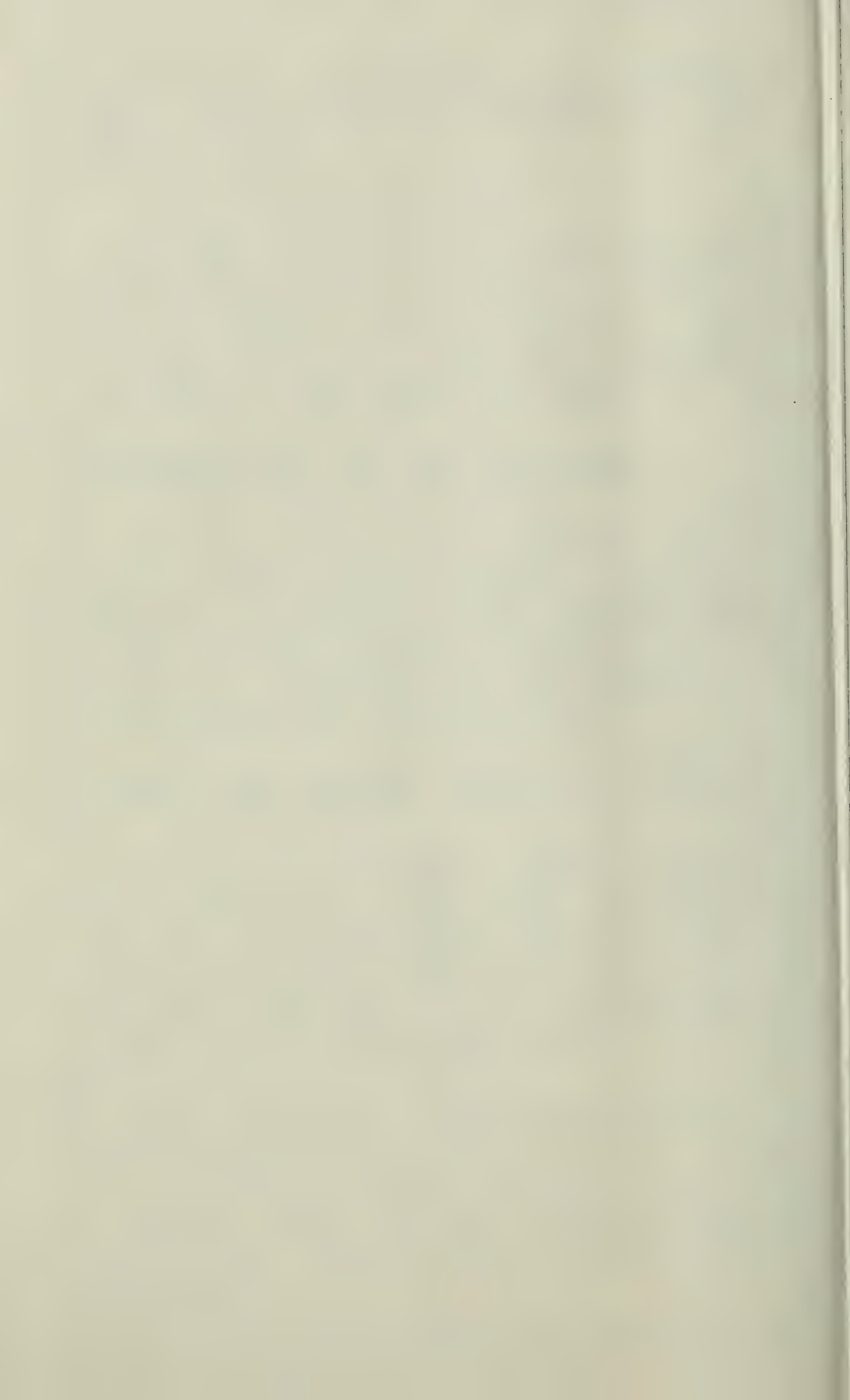
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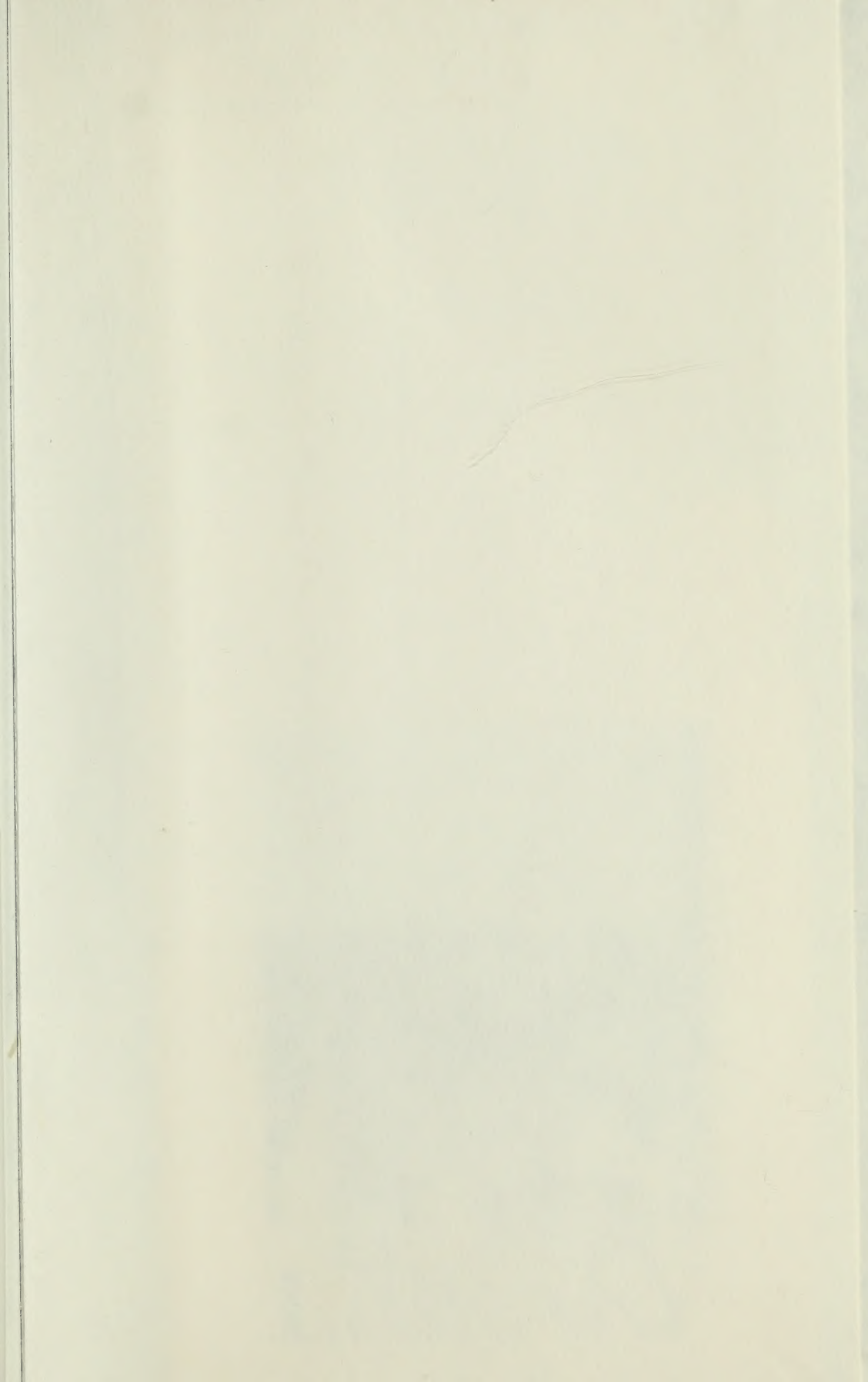
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